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COMPUTERWORLD

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Lt. Steve Ronce, Mike Nichoff, Greg Karver and Randy Andrews (from left) of the San Jose Police High Tech Crime unit

JOHN HARRING

ERP more than a 2000 fix

BUSINESS NEEDS, CHANGES DRIVE IMPLEMENTATIONS

By Craig Stedman

IT'S STARTING to look like the ERP express won't slow down much even after the supply of year 2000 fuel runs dry.

ENTERPRISE APPLICATIONS

Until now, purchases of enterprise resource planning applications were widely expected to fall off their feverish pace as users run out of time to fix year 2000 problems by installing packaged software.

But many analysts are now saying they see no evidence of that. The explanation. Although a desire to avoid year 2000 fixes on homegrown applications has undoubtedly helped prod ERP projects to life, users have plenty of other pressing business reasons for buying packaged software.

In fact, year 2000 fixes didn't even make the list of top ERP incentives in a recent survey of 50 information technology executives by Forrester Research, Inc. in Cambridge, Mass. Get-

ERP, page 84

TRW future linked to key IT projects

By Bob Wallace

TRW, INC. LAST WEEK announced sizable layoffs, plant closings and spending cuts aimed at boosting profitability while cutting the cost of its automotive products. Industry observers were quick to link several key information technology projects to the future of the automotive supplier.

TRW is in good health overall, analysts said. The automotive unit, which accounted for $7 billion of TRW's $12 billion in total revenue last year, is also profitable and in good shape, but it posted decreases in sales and operating profits for the second quarter of 1998.

"We're under tremendous

TRW, page 85

HP tightens its belt

▸ *Low commodity profit margins force cuts*

By Jaikumar Vijayan

IT WILL BE an unsettled Hewlett-Packard Co. that faces its customers at the HP World show in San Diego this week.

Barely two weeks after warning investors of a weaker-than-expected quarter — its sixth in a row — the Palo Alto, Calif.-based company last week said it is asking about 2,400 midlevel managers to take a temporary 5% pay cut.

The move is part of a cost-containment effort that includes closing HP's U.S. offices for four days between Christmas and New Year's Day as well as cutbacks in travel and hiring.

Although HP's financial results have been lower than expected during the past 18 months, the company has con-

HP, page 85

Rising laptop theft tacks on $150 a box

▸ *Tales of highway bandits and inside jobs*

By Kim S. Nash

LAPTOP THEFT has gone haywire.

Thieves, increasingly working in elaborate rings of robbers, brokers and fences, have left victims bloodied and police frustrated. Cargo theft of laptops — sometimes at gunpoint — is on the rise. So is a gentler crime: well-dressed crooks walking into office buildings and walking out unnoticed with unguarded laptops.

This escalating crime wave is costing laptop buyers an estimated $150 extra per machine, according to experts tracking the problem.

User companies, some that have been victimized, are taking

Rising thefts, page 24

Telco mergers should prompt contract review

By Matt Hamblen

WITH REGIONAL BELLS to the left of them and global carriers to the right, network managers dizzy from the recent spate of mergers should see their lawyers about reviewing service contracts, users and experts said last week.

In the wake of the latest pacts — a $55 billion Bell Atlantic Corp./GTE Corp. marriage and a $10 billion service alliance between AT&T Corp. and British Telecommunications PLC — business users said they worry that the new megacarriers will

Telco contracts, page 84

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Keep both eyes open – wide – before you approach E-commerce suites.

These all-in-one products are still immature. A review of representative suites from IBM, OpenMarket and Microsoft shows that these suites are getting easier to use, but they do have some installation and usability glitches.

Review Center, page 60

RICHARD DOWNS

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Imagine 240 pounds of buffed Gates. Why not? Image is everything, and IS needs a makeover. **In Depth, page 66**

In [illegible] reveal the agony of recruiting in the shadow of Microsoft. **Regional Scope, page 71**

Asking some hard-nosed questions in the job interview can help you find the right person. **Managing, page 58**

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YEAR 2000

Year 2000 isn't the big driver of corporate application purchases after all, analysts say. **1**

Paul Gillin catches up with a millennium-bug crusader who first brought the problem to the public in 1984. **33**

Fred Craig is trying to help the entire auto industry — and partners in related industries — win the millennium war. **39**

A three-month delay in a medical payment system because of government year 2000 work has doctors and hospitals riled. **40**

The FAA claims that another of its air traffic control systems has proved year 2000-ready, but IBM and others aren't so sure. **53**

EXECUTIVE Briefing

News summary for senior managers

■ **Laptops are hot in more ways than one.** Last year, a billion dollars' worth were stolen. The machines are easy to resell, making them a hit with muggers, hijackers and burglars. By some estimates, this crime wave pads the price of each laptop sold by $150. Moreover, many thefts are inside jobs. Large corporations are instituting policies to address the problem. Page 1

■ **As last week's Bell Atlantic/GTE merger piles into the AT&T/British Telecommunications alliance,** network managers should bone up on writing service contracts to their advantage. Analysts say the new megacarriers may favor stockholders over customers, so new services may be delayed. Page 1

■ **Along with other federal agencies, the Federal Aviation Administration has come under heavy fire for its stumbling approach to the year 2000 problem.** So when the FAA abruptly announced last week that it has tested 40 of its elderly IBM air-traffic control mainframes and found them millennium-ready, skepticism reigned. Page 53

■ **PeopleSoft became the No. 2 ERP vendor largely by focusing on markets in which SAP, the undisputed No. 1, didn't play.** Now, the companies are stepping onto each other's turf; SAP is filling its human resources gaps, while PeopleSoft is upping its manufacturing applications. Look for the ERP leaders to lock horns more in the future. Page 17

■ **Many companies installing packaged applications such as SAP's R/3 are weighting their project teams much more toward business users than IT workers.** The reason: Their top to-do item is getting the business ready for the technology. Page 39

■ **Signing bonuses are now common in filling nearly any IS position.** In today's shark-tank job market, you may need to grease a raw Web developer $2,000; an experienced app-dev manager may run you $10,000 or more. Page 67

■ **Bonuses notwithstanding, money is seldom the crucial factor when IS workers change jobs.** Two recent studies indicate exhaustion, projects in turmoil and career bottlenecks are all more important than salary in predicting whether IS employees will stay or go. Throwing money at dissatisfied workers is futile in the long run. Page 4

■ **In a bold — some said unprecedented — move, Microsoft brought a counterclaim against the 20 states suing it for antitrust.** The company argues that because its Windows products are protected by federal copyright law, state laws regulating anticompetitive behavior shouldn't apply. Legal experts say the maneuver will probably fail. Page 8

■ **The long-promised sub-$1,000 PC has landed in the real world.** Corporate IS shops are nabbing Pentium- or even Pentium II-based machines at that magic price point. Page 53

Corporate nets sidestep E-mail bug

▸ *'Long filename' flaw can be detected by many virus scanning gateways*

By Roberta Fusaro

A SECURITY FLAW found last week in some Microsoft and Netscape E-mail programs is definitely cause for concern for millions of users — but it isn't exactly Armageddon in a file attachment, analysts said.

Despite the hype surrounding the bug, it isn't likely to present huge problems right now for most corporate users, said Philip Carden, a managing consultant at Renaissance Worldwide, Inc., an international business and technology consultancy in Newton, Mass.

That's because most companies use virus scanning software, both as part of their standard desktop configurations and as gateways at the perimeter of their networks, he explained.

The gateways, which are being recognized more widely as a second line of defense against such viruses, could be adjusted to accommodate for any E-mail flaws that are discovered, Cardeo said.

Several security software companies are responding to the glitch by upgrading their products to handle it. WorldTalk, Inc. last week said it will update its WorldSecure Server E-mail security software to handle the filename flaw.

And Network Associates, Inc. said it will update its Net Tools Secure network security products to address the problem.

The so-called "long filename" bug — discovered in testing last month by Finland's Oulu University Secure Programming Group — has thus far been confined to testing labs.

Neither Microsoft Corp. nor Netscape Communications Corp. officials have received customer complaints about it, but both promptly posted software patches to their World Wide Web sites last week (see story at right).

However, Paul Thurrott, a systems administrator at Big Tent Media Labs, Inc., a media company in Berkeley, Calif., said he considers the problem to be quite serious.

DIFFERENT VIEW

"Most E-mail bugs involve attachments embedded in the message. This one seems more insidious because you can become infected just by viewing or opening the document," he said. His company uses Outlook 98, one of the affected mail programs, to link thousands of users.

The company works with more than a dozen large publishing companies, helping them post their information on the Web. Thurrott said Big Tent would deploy the fix that Microsoft made available at its Web site last week.

E-mail has become the vehicle of choice for some virus writers, analysts said, and the latest problem just strengthens the argument that companies should install virus scanning software. But such bugs are on a list of security worries at many large companies.

OTHER WORRIES

"The flaw is threatening as a tool for evil hackers, but I think there are far more serious corporate security issues going on at companies," said David Card, an analyst at Jupiter Communications, Inc., a New York-based consultancy.

Those issues include protecting user passwords and controlling Internet activities among employees. But even for consumers, spam is probably a bigger problem, he said.

Analysts saw more potential threat for Netscape Mail users because Communicator/Navigator has a place on corporate desktops. Outlook Express, on the other hand, is largely a consumer product. And because the product is still fairly new, companies haven't fully upgraded to Outlook 98, analysts said. Rather, they are using an Exchange server for messaging, Cardeo said. Older versions of Outlook aren't susceptible to the filename bug. □

Bug patches

What is this long filename bug?

The E-mail glitch occurs when a user receives or attempts to download, launch or view a file attachment that has a filename of more than 200 characters. That can cause the E-mail application to shut down. Once the application has crashed, a hacker could embed at the end of the long filename malicious code that can damage the recipient's hard drive or run arbitrary code in the computer's memory.

What is the response from Microsoft?

On its security Web page (*www.microsoft.com/security*), Microsoft posted software patches that address the filename bug in its Outlook 98 and Outlook Express clients. The flaw affects Outlook 98 on Windows platforms, and Outlook Express with Internet Explorer 4.0 and 4.01 on Windows platforms, Solaris and the Macintosh.

What about Netscape?

Netscape officials last week posted a notice about the problem to its Web site (*www.netscape.com*) and will post a patch for Windows NT and Windows versions of its Navigator browser within the next two weeks. The flaw affects mail and news components of Netscape Communicator 4.0 through 4.05, and the Netscape Communicator 4.5 beta release, on Windows platforms. The company said Macintosh and Unix versions of Communicator aren't vulnerable to attack.

Any advice for users?

Download the fixes from either the Netscape or Microsoft Web sites. Netscape users should refrain from using the File menu when a message is selected. Clicking on the File menu could trigger an attack if an over-long filename is part of a mail attachment.

— Roberta Fusaro

Study: Money can't buy IT loyalty

By Barb Cole-Gomolski

IN TODAY'S TIGHT labor market, a lot of IS departments are throwing money at people in hopes of holding on to scarce talent.

But are they actually doing more harm than good? Evidence is mounting that money won't make information systems staffers stay put and that they usually don't leave over pay.

A study of 46 companies to be published this fall by The Concours Group, a management consulting firm in Kingwood, Texas, detected several triggers that increase the risk that an IS employee will leave. They include assignment to a long-term project, exhaustion and turmoil on a project team or in the company.

Separately, a recent study of 250 IS professionals who had switched jobs in the past year by The Hay Group, a consulting firm in New York, showed that staffers were most likely to leave for career advancement. But 71% of respondents said enjoyment of work was a key factor in their move, and 57% said they placed a lot of value on a clearly developed career plan.

"The excessive turnover we're seeing in many IS departments is a result of problems in the organization," said Nick Vitalari, vice president of The Concours Group. "The current job market is just making it easier for [IS staffers] to do something about it." Turnover is costly and can derail business-critical projects.

The Concours study revealed that companies with the lowest turnover tended to have programs that focused on individual career development. Those firms also were good at anticipating IS staffing needs and staying abreast of what types of IS skills other companies in their area were hiring. That helped them determine how scarce talent would be.

Those companies also were willing to build project schedules that weren't based on fiscal calendars and gave the company the flexibility to rotate people and avoid burnout.

Accounting and consulting giant KPMG Peat Marwick in Montvale, N.J., saw its retention rate improve almost 20% in one year after implementing a career development program. The effort includes regular meetings with a partner in the firm to discuss their performance and what is expected of them, said Mary Sullivan, director of human resources.

"We cannot let our people be talking to headhunters more than they are talking to our partners," she said.

The Concours Group research also suggests that the increasingly common practice of hiring contract workers has backfired at some sites.

"If everybody is working lots of overtime but the contractors are getting paid 100 bucks an hour and staffers are getting nothing, that creates resentment," said David Dell, author of the Concours study.

Dell said some companies in the study had begun paying overtime to staff programmers to even things out.

The problem with doling out money is that it is hard to keep things equitable in the eyes of employees, according to the Concours researchers.

For example, Pinnacle Brands, Inc., a sports trading card company in Grand Prairie, Texas, recently adjusted salaries for IS staffers with hot skills, such as administrators for Oracle databases and Lotus Notes servers. "But we can't afford to do it across the board," said Dan Barth, the company's vice president and chief information officer.

Barth is concerned about how that might affect workers in other areas. □

BEST RETENTION PRACTICES

1. **Help employees develop individualized career plans**
2. **Give employees work that they like**
3. **Tell employees how their work is important to the business**
4. **Be willing to pay salaries near the top of the market**
5. **Use flex-time and other rewards besides monetary compensation**

Source: The Concours Group, Kingwood, Texas

Getting staff in the first place requires sign-on bonuses these days. Page 67

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Users get the skinny on security

▸ *Firewalls key topic of Black Hat hackers*

By Laura DiDio

USERS ATTENDING last week's Black Hat Briefings '98 in Las Vegas came away wiser and more wary about the state of their network security.

"I came in thinking I was pretty knowledgeable. I'm coming away with an overall sense of paranoia. In fact, I don't think I can be too paranoid about my network security — not after all the new techniques I learned about hacking," said Steve Morrison, a network administrator at Jones & Associates, Inc., a Los Angeles-based institutional investment firm that manages nearly $1 trillion in assets annually.

This year's hot buttons, according to the assorted security experts and hackers at the conference, included firewalls, remote access and virtual private networks, internetworking security and Windows NT, which has become a hacker favorite in the past year, experts said.

The state of firewall security is "shameful," and "businesses are doomed," said Network Flight Recorder, Inc. President and CEO Marcus Ranum, who is generally credited with creating one of the first network firewalls. Still, there is a saving grace in that for security administrators, "you'll always have job security," he said.

THE ASSOCIATED PRESS

Noted hacker Mudge discussed techniques used to break in to Windows NT

Ranum also took a variety of software vendors to task. Microsoft, Ranum said, is notorious for releasing bad code.

Six user attendees interviewed by *Computerworld* said that, as administrators, they know it is up to them to properly turn on and configure the security mechanisms within NT. But the users said they were still surprised at how many new techniques there are for hacking the operating system.

"I wanted to learn as much as I could about Windows NT penetration testing, and I did. NT is like Swiss cheese. It's got a lot of holes," said Cedric Welch, information systems auditor at Union Pacific Corp. in Omaha. The parent company of Union Pacific Railroad has 25,000 users.

Welch said he appreciated the chance to query noted hacker Mudge of the Boston-based LOpht group, on his published LOphtcrack techniques for hacking into NT via software tools and remote access.

Welch said he would pore over his network with a fine-tooth comb to "shore up all the holes. . . . It's been a good experience. I feel empowered. Now I'm going to put it to use."

GROWING IMPORTANCE

The conference, sponsored by Secure Computing Corp., drew about 360 corporate and government security professionals from as far away as Egypt and Australia. That was triple the number that attended last year, said Jeff Moss, director of Secure's risk-assessment group.

Moss, a 28-year-old former hacker — Dark Tangent — founded the Black Hat conference six years ago "to strip away vendor hype and let real users come face-to-face with real hackers who could tell them where the biggest threats lie."

Black Hat Briefings is notable for the high level of speaker talent it attracts, including Ranum and Bruce Schneier, one of the nation's top cryptographers, who runs Counterpane Systems, Inc. in Minneapolis.

Then there are the hackers. Ray Kaplan, an information security professional at Secure, ran a "Meet the Enemy" panel in which security administrators came face-to-face with the very people — such as Mudge, Dildog and Jericho — who publish various hacks into Microsoft Corp.'s Windows NT and Novell, Inc.'s NetWare. □

Amex/Visa deal to push smart-card technology

By Barb Cole-Gomolski

AMERICAN EXPRESS CO. and Visa International, Inc. have formed a joint venture that will focus on developing applications for smart cards in a move that could spur use of the technology in the U.S.

The companies hope that their smart-card applications will become the standards for the electronic-commerce industry, though their goal is to design open interfaces that will support competitors' systems.

Banksys SA in Belgium and ERG Ltd. in Australia are also partners in the venture, called Proton World International. The company will continue to develop and license smart-card applications that were originally developed by Banksys, including the Proton electronic purse application used by 30 million people globally.

Smart cards look like credit cards but have an embedded chip to store and process information. They can be used to store applications or information — such as a private key for encryption — that might not be secure on a hard drive. They also can securely hold credit information or electronic cash.

NECESSARY TOOL

Matthew Kovar, an analyst at The Yankee Group in Boston, said smart cards will become essential as companies deploy electronic-commerce applications for which "user name and password are no longer adequate security."

Jim Balderston, an analyst at Zona Research, Inc. in Redwood City, Calif., said establishing a smart-card standard — particularly in the more desirable multifunction smart-card arena — might entice more people to use them.

Credit-card companies have been reluctant to push multifunction smart cards because they dilute the credit-card company's brand by replacing traditional credit cards. But the move by New York-based American Express and Foster City, Calif.-based Visa indicates that these firms believe they have more to gain with smart cards than they have to lose, he said.

"If you have a multifunction smart card, you can use it to gain entry to your office, take money out of the bank and ride mass transit," Balderston said.

Proton World International isn't alone in trying to set a smart-card applications standard. MasterCard International, Inc. supports the Mondex electronic purse system, which analysts said isn't as widespread as the Proton system. □

Smart Ship trial hits snag

▸ *Navy still confident of program's potential*

By Matt Hamblen

THE U.S. NAVY'S Smart Ship trial program is moving full speed ahead despite a software glitch aboard the cruiser USS *Yorktown* last September that left the ship without propulsion at sea for nearly three hours.

The Smart Ship program was conceived in 1995 amid defense budget cuts as a way to reduce the crew needed aboard a ship by automating several functions, Navy officials said. The trial program aboard the *Yorktown*, on which 13% of the crew and 30% of the workload have been reduced, will soon be expanded to four other cruisers.

Official Navy reaction to the *Yorktown* incident is that it provided a learning experience and posed no danger. Despite that confidence, two Navy personnel expressed concerns about using Smart Ship technology.

"I don't have any faith in [Smart Ship systems] yet," said Pat Carlin, an engineering technician in the Atlantic Fleet Surface Force in Norfolk, Va., in an interview last week. Anthony DiGiorgio, a civilian engineer in the fleet, wrote an article in June for the Naval Institute's *Proceedings* magazine that questioned why computers running Windows NT 4.0 on the *Yorktown* weren't designed to tolerate simple failures such as the one that caused the problem.

LOST AT SEA

The *Yorktown* lost control of its propulsion system Sept. 21 during maneuvers off the Virginia coast. A computer system outage occurred when a program administrator onboard entered a zero in a data field for a fuel valve control, and the control system froze, fleet officials said last week.

The Navy will train its staff to avoid such mistakes in the future, and software is being written to prevent such a mishap from happening again, according to a memo issued one month after the incident by Vice Adm. Henry Giffin.

The USS *Yorktown* incident hasn't mired the Smart Ship program. Navy officials saw it as a learning experience

The *Yorktown*, commissioned in 1984, is so far the only ship in the Smart Ship program retrofitted with off-the-shelf computers.

Despite the *Yorktown* problem, the Navy plans to use Smart Ship technology, including Windows NT 4.0 servers, on four other Ticonderoga-class cruisers. In May, the Navy awarded Litton Integrated Systems Corp. in Woodland Hills, Calif., a $138 million contract to provide those upgrades, said Cmdr. John Singley, a spokesman for the Atlantic Fleet Surface Force in Norfolk.

"The Smart Ship program is full speed ahead, as we say, and the recent contract award shows that," Singley said. "This one incident [in September] was not a defining moment, and the ship was not in danger when it lost propulsion. It was human error. . . . I'm glad it happened. We learned from it." □

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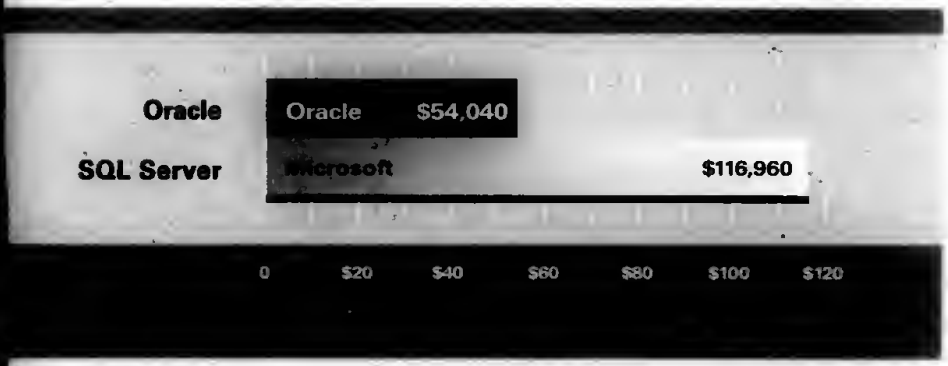

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Microsoft opts for copyright defense

▸ *Daring tact says federal copyright law supersedes state antitrust laws*

By Kim S. Nash

MICROSOFT CORP. last week brought a counterclaim against the 20 states suing it, accusing them of illegally trying to apply state antitrust laws to Microsoft's federally protected products.

The tactic is daring — some say unprecedented — and not likely to be a winner, legal experts said.

ANTITRUST CASE

Specifically, the Redmond, Wash.-based vendor said the Windows 95 and Windows 98 operating systems — the latter of which is targeted in the antitrust suit — are copyrighted works.

As such, they are protected by federal copyright law, which gives the copyright owner rights that Microsoft said should outweigh state laws regulating anticompetitive behavior.

LEGITIMATE PROTECTION?

For example, Microsoft's contracts with PC makers are under fire for prohibiting the hardware vendors from modifying Windows screens to their liking. But Microsoft argued that copyright protections let it license Windows 98 "in unaltered form."

Microsoft is asking that all the claims brought against it under state laws be dropped. Federal claims would still stand.

"This is an unprecedented argument," said Hillard Sterling, an antitrust lawyer at Gordon & Glickson PC in Chicago.

Microsoft is arguing that it gets immunity from state laws by virtue of holding federal copyrights, but it "probably will fail," Sterling said.

"What Microsoft is saying is that state law claims can't attack or interfere with any business practice that involves the use or distribution of a copyrighted work," said Dana Hayter, an antitrust and intellectual property lawyer at Fenwick & West LLP in Palo Alto, Calif.

But simply because a product is copyrighted under federal law doesn't mean it isn't subject to state antitrust laws, Hayter said. "Microsoft is not likely to prevail [in that argument] because there's no strong legal foundation for it," he said. "And as a practical matter, you'd be saying that no states can regulate software."

A Microsoft spokesman declined to comment on how risky a strategy this is, but did say, "We wouldn't bring the claim unless we believe it's based in fact and in law."

The states, however, "disagree with the contention that copyright law gives [Microsoft] exemption or immunity from state antitrust law," said a spokesman for the attorney general in Iowa, one of the states leading the case. He added that states also have the right to enforce federal antitrust laws and that they indeed filed both state and federal antitrust claims against Microsoft.

The counterclaim was part of court papers Microsoft filed last week in response to a combined antitrust suit filed by the states and the U.S. Department of Justice. That suit is set for trial Sept. 8.

Though the separate suits filed by the states and Justice Department were combined, it is to Microsoft's advantage to try to wipe out any state-level claims, Sterling said. That's because if Microsoft loses, it would have to face an array of penalties because antitrust laws in the 20 states suing it differ, he said.

DENIES WRONGDOING

In its 24-page response, Microsoft denied all allegations in the suit, specifically rejecting the idea that two June 1995 meetings with Netscape Communications Corp. were an attempt to collude with its rival to divide the Internet software market. Other arguments include the following.

- Microsoft couldn't have bundled its World Wide Web browser with Windows to crush Netscape because Microsoft planned to add Internet features to Windows long before Netscape became a company.
- Microsoft's contracts with Internet service providers aren't "exclusionary," because they don't block Netscape's competing browser from being available to the public.
- Microsoft's contracts with PC makers don't illegally restrict them from customizing Windows; Microsoft is willing to negotiate ways to alter Windows screens.

In a motion for preliminary injunction, the governments have asked U.S. District Judge Thomas Penfield Jackson to either order Microsoft to stop bundling its Internet Explorer browser with Windows or force the vendor to ship Netscape's browser with Windows.

Jackson plans to hear oral arguments about that proposal on the same day the trial starts. Microsoft's written response to the motion is due next Monday. □

Microsoft loses round in Caldera suit

Caldera, Inc., a small operating system company in Orem, Utah, has won a big round in its private antitrust lawsuit against Microsoft. Last week, Microsoft was ordered to turn over Windows 95 source code to Caldera lawyers by this week.

Caldera wants to study Windows 95 source code for evidence to bolster its case, but Microsoft objected, saying the code is confidential.

In its 1996 suit, Caldera accused Microsoft of making false statements that exaggerated some Windows compatibility problems with Caldera's DR-DOS operating system and of deliberately programming Windows not to work well with DR-DOS. The suit is slated for trial next year.

Novell, Inc., which owned DR-DOS before Caldera, had for years grumbled about allegedly anticompetitive business practices used by Microsoft's MS-DOS operating system unit. Novell had collected documents related to the cause but never filed a lawsuit. When Caldera bought DR-DOS in 1996, it did.

In a related order, Federal Judge Ron Boyce told Novell it must give Microsoft those documents, which Microsoft subpoenaed last month. Microsoft wants the documents to help it prepare for its federal antitrust trial Sept. 8.

— Kim S. Nash

Online licenses lack standards and user interest

▸ *Developers team up to configure system*

By David Orenstein

DESPITE THE promise of online license distribution to provide quick access and deployment, software publishers and resellers are still looking for a standard while many corporate customers seek out a compelling reason to adopt it.

Industry insiders said the move toward electronic software distribution will be helped along somewhat by a marketing and technology partnership announced last week by Globetrotter Software, Inc., a license monitoring and enforcement software vendor in San Jose, Calif., and Preview Systems, Inc. in Cupertino, Calif., which makes electronic software distribution software.

The two companies plan to release a system by year's end that lets customers configure and download licenses over the World Wide Web. Customers would download encrypted software from various online stores and unlock the software using the licenses.

GROWING NUMBERS

Today, more than 18% of software publishers sell and distribute full versions of their software over the Web, according to a recent Software Publishers Association (SPA) survey.

Last year, Cambridge, Mass.-based Forrester Research, Inc. projected that 84% of software publishers expect electronic software distribution to account for about 50% of their sales by 2001.

Perhaps by then the industry will have changed the mind of users such as Andrew Drooker, director of infrastructure and technology at Turner Broadcasting System, Inc.'s sales unit, which generates about two-thirds of the revenue for cable television channels owner Ted Turner sold to Time Warner, Inc. earlier this year.

Today, more than 18% of software publishers sell and distribute full versions of their software over the Web.

Drooker said he saves time using Microsoft Corp.'s Systems Management Server to electronically distribute software to clients in-house, but he doesn't trust the Web as a way to acquire the software.

BITTER TASTE

"I'd still like that CD. You get bitten once, and that's all it takes," Drooker said, recalling how he once had to rebuild a server that was caused to crash by a corrupt file in a downloaded copy of a service pack for Windows NT Version 4.0.

Drooker said buying software licenses online would work only if he could still make that transaction with a slip of paper or a canceled check to present to the accounting department. A line item on the corporate American Express card won't suffice, he said.

Joe Fink, chief information officer at clothes maker Guess, Inc. in Los Angeles, said his company buys online only occasionally. Although he does much of his personal software and book buying online and enjoys the convenience, Fink said he has yet to see compelling reasons to do it at a corporate level.

However, he said he expects that day to come. "I see almost everything going toward being electronic," he said.

Online software volume licensing also raises workflow questions for customers and sellers alike, said Fran Foster, Internet section manager at the SPA.

The trade association is working on workflow recommendations, which are to be released in September. □

Data warehouses: Plan well, start small

By Stewart Deck
New York

DATA WAREHOUSE VETERANS say a few key strategies can determine the difference between a data warehouse that everyone clamors to use and one that gathers dust like a once-trendy exercise machine.

If a warehouse's initial cost is underestimated and its scope too large, it could start to gather that dust, said users at last week's Data Warehouse World conference. But by involving experienced people, paying proper attention to data validation and starting with small goals, data warehouse projects can hum right along.

Warehouse payoff
Veterans' tips for a successful data warehouse project

- Design it for multiple users
- Keep business objectives in sight
- Start small
- Don't underestimate costs
- Show what new types of analysis are possible
- Invest in end-user training

Gene Fernandez, vice president of data warehousing at Merrill Lynch & Co. in New York, said the best data warehouses "start with a small piece that [a company] can use to demonstrate a data warehouse's benefits."

Starting small doesn't mean that such projects should have small aspirations, though. The first small successes with a data warehouse will trigger its growth, said Glenn Piepert, an analyst at Conversion Services International, Inc., an East Hanover, N.J.-based consultancy.

Data warehouse designers have to plan for such expansion. Make sure the architecture you choose from the start — from the system's hardware and software to data extraction routines and database forms — can handle a much heavier load as it grows, Piepert said.

Many users are looking for ways to migrate data from enterprise resource planning systems into a data warehouse or a smaller data mart, said Jackie Sweeney, an analyst at International Data Corp. in Framingham, Mass. "That's a big opportunity for the data mart and data warehouse vendors because a lot of users are at that point," Sweeney said.

Meta data and meta-data repositories were also two popular topics at the show. "The trend seems to be, rather than build huge global data warehouses, build global data warehousing meta-data models by creating an information model the same way you would for an operational database," said Mitch Kramer, an analyst at Patricia Seybold Group in Boston.

Mark Weerda, desktop computing manager at Famous Footwear, a national shoe-store chain based in Madison, Wis., said although he was interested in some of those larger issues, he was also focused on his own data warehousing project. Weerda said he has been able to keep his project from exploding in size by continually prioritizing the benefits it will achieve. To do that, Weerda said, he ties the project's goals to "building strategic advantages."

Weerda, like Fernandez, said selling the idea of a data warehouse to company executives can be daunting. But illustrating the new types of analyses, the faster analysis response time and the way individual users can generate their own detailed data reports goes a long way toward persuading management.

Fernandez said data warehouse planners should "invest in end-user training — and don't underestimate the cost of either training or support after the project has been implemented." He also said bringing in senior managers to help target big company problems or opportunities often leads to success. □

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Boole to unveil tool for united view

By Patrick Dryden

BOOLE & BABBAGE, INC. wants to get its foot in the door — and keep it there — as IS groups attempt to unite all their networks, systems and applications in a strategic management architecture.

At the annual Enterprise Management Summit conference this week in Santa Clara, Calif., the management software vendor will introduce Version 4.0 of Command/Post. The tool filters alerts from diverse sources and correlates the events to help operators recognize service problems and automate responses.

Boole & Babbage's goal is to make Command/Post more appealing to information systems groups both now and in the future.

IS groups can quickly consolidate and handle the glut of status messages they face today, and they can keep that platform when — or if — they finish implementing a full-featured management suite such as Unicenter from Computer Associates International, Inc., OpenView from Hewlett-Packard Co. or Tivoli Management Environment from Tivoli Systems, Inc.

"A large IS organization covering a complex environment may wind up with several big management platforms, so it's important that each can share information," said Command/Post 4.0 beta-tester Tim Hunt, a systems engineer at Norwest Services, Inc. in Minneapolis.

A large IS organization covering a complex environment may wind up with several big management platforms, so it's important that each can share information,"
– Tim Hunt
Norwest Services

The IS arm of Norwest Bank had "rolled its own" connections between Command/Post, Tivoli's framework and HP's OpenView IT/Operations, Hunt said. Boole & Babbage's interfaces to those management systems will allow groups to exchange event information more completely, he said.

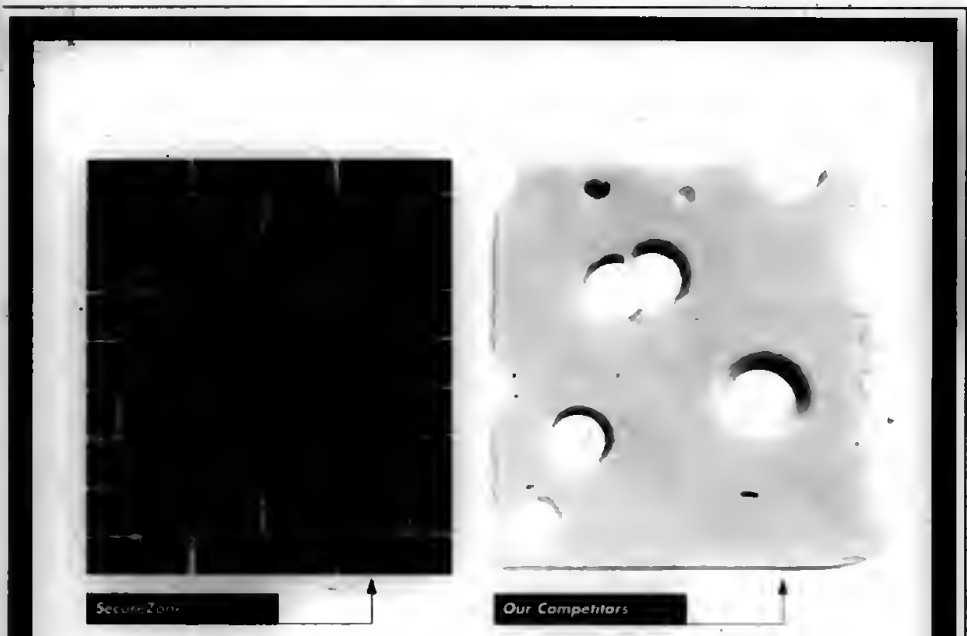
Formally offering integration interfaces to the major frameworks should help San Jose, Calif.-based Boole & Babbage compete for the same systems management budget, said Herb VanHook, an analyst at Meta Group, Inc. in Westport, Conn. "Command/Post may be easier to implement than the big suites for consolidating events, but it's still not an across-the-board solution," he said.

With the new version, Boole & Babbage officials said they expect the following improvements:

- Quicker payback. Default settings and installation wizards slash the time needed to set up the server and generate reports from days to hours.
- Broader access. Simpler charts speak to users on the business side, too. New console options include Windows 95 and 98 clients, a fully interactive browser and a "lite" interface for examining status icons via dial-up connections.
- More scalability. Servers can run on Windows NT as a midlevel manager in a management hierarchy, and new modules can monitor AS/400, Oracle Corp. and SAP AG R/3 servers.

"The browser interface should let us easily roll out access to new users in remote offices and business departments," Hunt said. "But the year 2000 compliance [in this new version] is the only thing we really need right away."

Pricing for Command/Post starts at $95,000. □



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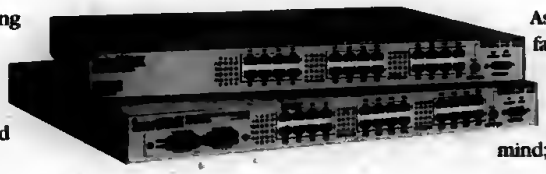

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FRANKLY SPEAKING

My top 100

FRANK HAYES

LADIES AND GENTLEMEN, welcome to Frankly Speaking's Top 100 IT Products of the 20th Century.

Sure, you've already seen lists of the Top 100 films, the Top 100 novels, the Top 100 people of the 20th century. Made your blood boil, right?

This one's different. I didn't assemble a bunch of experts or ask a batch of celebrities their favorite information technology products.

I did it the old-fashioned way: I sat down and made a list.

Did I do it for posterity, to honor the art and science of business information systems gone by? Yeah, sure.

Mostly, though, I did it because it was good, clean summer fun, deciding what products would make the list and how high they would go.

Would MS-DOS rank above VMS? Which made a bigger impact, Tandem or Teradata? What dead languages or dying applications were the lifeblood of the IS shop not that long ago?

My rules were simple: I picked products (not technologies) that had a major impact on the corporate IS shop — or MIS, or data processing or the tabulating department, depending on when the product was introduced. And I ranked them by impact, not revenue or installed base.

I didn't assemble a panel of experts. ... I sat down and made a list.

Unfortunately, the whole Top 100 list won't fit in this column. You'll find most of it — the most interesting choices, if you ask me — on *Computerworld*'s Web site at *www.computerworld.com*.

But here's the top 10% of my Top 100 list:

1. IBM System 360. Not the first mainframe, but 30 years later it's still king of the dinosaurs, thanks largely to IBM's decision to create a family of compatible machines. Of course, that could be why we have year 2000 problems, too.

2. Microsoft Windows 3.1. The graphical user interface that convinced corporate IS there was something to this mouse business after all.

3. Cobol II. You're probably hip-deep in it for your year 2000 project. You might never start another project using code written in any flavor of Cobol, but you'll be maintaining it for a long, long time.

4. IBM Model 405 Tabulator. This pre-computer data processor counted punch cards — and it, and its ilk, ruled tabulating departments for half the century. It was so widely used that IBM made its first mainframes behave like card tabulators — and demolished its competition, the Univac.

5. IBM Personal Computer. Not the first desktop computer, not the best and not the most beloved — just the one that created a revolution.

6. Lotus 1-2-3. Not the first spreadsheet — wait, you've heard that already. VisiCalc was smuggled in by users with Apple IIs, one at a time. Lotus 1-2-3 came in the front door by the busload.

7. IBM Professional Office System. Profs defined mainframe-based E-mail for decades. It's officially dead, but don't tell the people who still use it. You can even get a Web browser for it.

8. Novell NetWare. One word: pervasive.

9. Netscape Navigator. Netscape changed the Internet from an E-mail transport to an effective way of marketing products — and stretched corporate IT far beyond the IS shop.

10. WordPerfect for DOS. WordPerfect sold its generic word processor bundled with templates for lawyers, doctors, accountants and every other kind of business user. A triumph of business usefulness over technical glitz.

Got your blood boiling yet? Good. Now here's your chance to get *me* steaming. Check out the rest of my list on the Web, and tell me what's missing — and where I missed the boat entirely — at frank_hayes@cw.com. And we'll see whose blood vaporizes first. □

Hayes is Computerworld's staff columnist. His Internet address is frank_hayes@cw.com.

SHORTS

Gore calls for privacy laws

Vice President Al Gore Friday called for legislation that would require companies to protect people's medical and financial records and ban firms from collecting personal information over the Internet from children under 13 without their parents' permission. Gore's call for an Electronic Bill of Rights applies to both online and other uses of personal information.

Clinton files year 2000 bill

President Clinton last week forwarded the Year 2000 Information Disclosure Act to Congress. Originally called the Good Samaritan bill, it would promote information sharing about year 2000 repairs by protecting organizations that share such information in good faith from liability claims based on the information exchanged. Advertising and statements made directly to a consumer or government agencies would be exempt.

No more Notes for NetWare

Lotus Development Corp. last week said it will stop developing Notes/Domino groupware for Novell, Inc.'s NetWare operating system. Officials said Lotus customers aren't using NetWare for E-mail or collaboration software. Instead, they are moving more frequently to Windows NT and Unix operating systems. Lotus will continue to support NetWare for at least four years and will create migration tools.

Most phone calls set for 2000

Telecommunications industry officials testified Friday that 98% of domestic phone calls made after Jan. 1, 2000, should reach their destinations but voiced uncertainty about billing systems used by carriers. Officials also raised concerns about the readiness of small domestic carriers and many international carriers and called for further testing and cooperation to share information among carriers and their customers.

High-tech deals up

Global mergers and takeovers in the information technology and communications industries have hit record levels this year, as companies sought growth through expanded products and services, according to a study released last week. Mergers and acquisitions rose 15% in the first six months of this year compared with that period last year, according to the study from Broadview, an investment bank in London. The value of the deals totaled $292 billion, an increase of 148% from the $117.7 billion in last year's first half.

Baan resigns as chairman

Less than a month after stepping down as CEO at The Baan Co., co-founder Jan Baan last week said he will resign as chairman of its management board. New CEO Tom Tinsley will be nominated to take over as chairman. Paul Baan, Jan's brother and fellow co-founder, is resigning from the supervisory board. Baan reported a second-quarter operating profit of $26.9 million, topping Wall Street expectations.

Ameritech turns back spam

E-mail transmissions between Ameritech.net and America Online, Inc. were back to normal last week after blocking measures were taken because of spam. Two weeks ago, Ameritech Corp. blocked incoming mail from America Online after E-mail sent to some AOL customers fraudulently listed Ameritech.net as the return address. America Online had attempted to return millions of E-mail messages to senders, creating a deluge on Ameritech's end. An Ameritech spokesman said E-mail not considered spam was sent on to users.

Paperless bill goes to Senate

The Senate Commerce Committee last week approved the Government Paperwork Elimination Act to require federal agencies to make online versions of their forms available. The bill also would allow businesses and individuals to use digital signatures to file the forms electronically. Federal agencies would still be required to make paper forms available. The Internal Revenue Service will be exempt from the act.

Firms must detail Y2K status

The Securities and Exchange Commission ruled that publicly held companies must detail their year 2000 readiness. Specifically, companies must reveal the cost of fixing their date bugs, the risks that year 2000 glitches pose and their contingency plans.

SHORT TAKES Listed only on German exchanges, **SAP AG** this week plans to list its stock on the New York Stock Exchange. . . . Component and networking products vendor **Adaptec, Inc.** last week announced the resignation of Grant Saviers, its CEO and chairman. The board has appointed company founder Larry Boucher as interim CEO. . . . **Financial Executives Institute** said 58% of survey respondents from high-tech companies said they have hired fewer qualified job applicants in the past three months because of the tight labor market. . . . **Artemis Management Systems** in Boulder, Colo., an IT project management consulting firm and software vendor, has acquired **Software Productivity Research, Inc.** in Burlington, Mass. Terms weren't disclosed.

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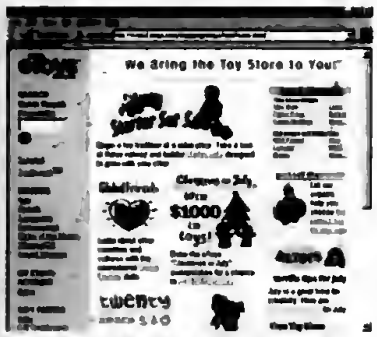
Online retailers prepare for holiday shoppers

By Sharon Machlis

TEMPERATURES OUTSIDE might be steamy, but for information technology executives doing online retailing, it's beginning to look a lot like Christmas.

"Yesterday in Redmond, [Wash.,] it was 100 degrees. We're trying to think snow," Judy Neuman, vice president of interactive media at Eddie Bauer, Inc., said last week. Eddie Bauer is one of many retailers working throughout the summer on site redesigns, upgrades and overhauls to prepare for the holiday shopping season.

In the relative downtime between spring and fall gardening buying, Garden Escape, Inc. is doing major upgrades aimed at handling additional holiday traffic and better serving customers.



EToys' Phil Polishook says EToys is planning a big ad campaign and expects up to a twentyfold increase in traffic

STREAMLINED APPROACH

For example, the company discovered last year that shoppers often wanted to send the same item to many different people on their list, said Clifford Sharples, president and CEO of the Austin, Texas-based company. The old site made customers go through a separate checkout process each time; this year, the site will offer a more streamlined approach.

Garden Escape is also moving from Silicon Graphics, Inc. servers to more powerful multiprocessor systems from Sun Microsystems, Inc. It also is changing server software from Netscape Communications Corp.'s Enterprise Server to the Unix Apache server software, which many heavily trafficked World Wide Web sites are using already.

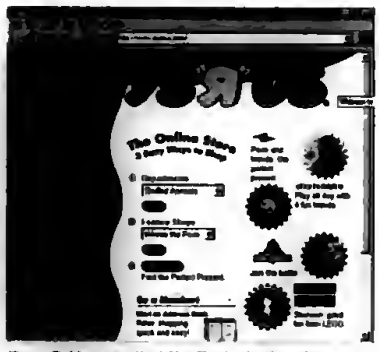
Garden Escape expects a tenfold increase in holiday shopping revenue over last year, which was 15 times higher than an initial small revenue base in 1996.

Other revamps in the works include the following:

■ CDnow, Inc. is developing a customized holiday shopping area to debut Nov. 1 that will allow shoppers to create their own 55-minute-long CDs from 12,000 available songs.

■ Macys.Com in San Francisco expects its overhauled site to be ready in October, featuring 250,000 merchandise items and a new user interface aimed at making it easier to browse and locate items. The project marks Federated Department Stores, Inc.'s most ambitious electronic-commerce project to date, with the creation of a standalone Internet subsidiary. The earlier site was largely experimental.

■ JC Penney Co. in Plano, Texas, expects to boost product offerings by 50% on its site this holiday season compared with last. Revenue is very small compared with JC Penney's $4 billion catalog business, but the company expects online sales to grow threefold this holiday season over last, said Rich Last, executive vice president at JC Penney International Catalog, Inc.



Toys R Us unveiled its first electronic-commerce site this summer

■ Toys R Us, Inc. in Paramus, N.J., unveiled its first electronic-commerce site this summer, with 1,500 products, and many more planned by Christmas.

■ EToys, Inc. in Santa Monica, Calif., is launching a major site redesign around Sept. 1 with a push into software, video games and books. The site had 1,000 items last fall and expects 6,000 by Oct. 1. "We're working on server load balancing, increasing our bandwidth and just buying more hardware," said Phil Polishook, vice president of marketing.

Eddie Bauer is conducting a major redesign to make its site easier to use and is also moving to Microsoft Corp.'s Site Server 3.0. Neuman said she likes the software's features that allow better understanding of how consumers use a site. It also has more features aimed at "upselling" — encouraging customers to buy more than they planned.

"At least we're struggling through this in July, not November," she said.

Few industry projections are available yet for this year's holiday shopping season on the Web. EMarketer, a New York market analysis company with generally conservative forecasts, says online sales will rise more than 200% this November and December, to about $1.26 billion, as more consumers and retailers go online. □

Java developers warm up to Visual Cafe

By David Orenstein

JAVA DEVELOPERS in complex corporate enterprises have warmly received recent announcements of tools that can simplify their tasks. But tools such as Symantec Corp.'s Visual Cafe, introduced last week, still have room to deliver even more, they said.

Symantec in Cupertino, Calif., promised users the ability to not only develop enterprise Java applications but also develop them with the greatest of ease with Visual Cafe 3.0 Enterprise Suite, due by year's end.

The tool will offer developers a unified view of all the objects, components and data on the enterprise as if they were on the developer's desktop computer, Symantec officials said. Its price wasn't announced.

Symantec will include popular features also present in other forthcoming Java tools from IBM and Microsoft Corp., such as the ability to debug code on remote machines and integrate tightly with Common Object Request Broker Architecture (CORBA).

Tim Jones, a senior Web architect at NationsBanc Montgomery Securities LLC in San Francisco, said the brokerage is looking for tools that could allow for easy integration of applications and data. A possible future application would let brokers match up Buy and Sell orders from one data source with client asset portfolios served from another. Visual Cafe 3.0 and CORBA appear to be the most likely choices, he said.

Frank Caloairo, a software engineer at Highmark, Inc. Blue Cross/Blue Shield in Camp Hill, Pa., said he is looking forward to the tool's automation of numerous coding tasks. With earlier versions of Cafe, Caloairo said he has had to write "servlets," or small applications that run on servers, as well as the Interface definition language for certain objects he wanted to incorporate into his Java applications.

Visual Cafe 3.0 will include many visual shortcuts that let developers establish links between data and objects without writing code.

But Highmark's manager of electronic data interchange systems, Scott Mangol, said he is concerned that the forthcoming Visual Cafe doesn't provide the ability to deliver Hypertext Markup Language (HTML) to clients. Many doctors with low-bandwidth Internet access use Highmark's system with HTML rather than slower, heavier Java.

Another user, Phil Wilkerson at Gap, Inc. in San Francisco, said he wondered why, despite a flurry of third-party support announcements from vendors such as Platinum Technology, Inc., BEA Systems, Inc. and Novera Software, Inc., there is no integrated testing tool.

Larry Perlstein, an analyst at Dataquest in San Jose, Calif., said users may wish Symantec planned to bundle more third-party tools in the suite rather than leaving them to choose tools.

Many users will be watching the new version of Visual Cafe closely for better support for the Swing component set, which is Java inventor Sun Microsystems, Inc.'s graphical user interface tool kit for Java. Some users sharply criticized the current release of Visual Cafe in newsgroup postings for its difficulty in compiling applications with Swing. □

COMPARING JAVA TOOLS

Several enterprise features are included in most of the major Java tools that have shipped or are headed to market. "Data aware" components are found in all five products.

Microsoft J++ 6.0*	Yes	Yes	No
IBM VisualAge 2.0*	Yes	Yes	Yes
Symantec Visual Cafe 3.0*	Yes	Yes	Yes
Borland JBuilder 2.0	No	No	Yes
Sybase PowerJ 2.1	Yes	No	Yes

*Not yet released

Source: Vendor Web sites, press releases

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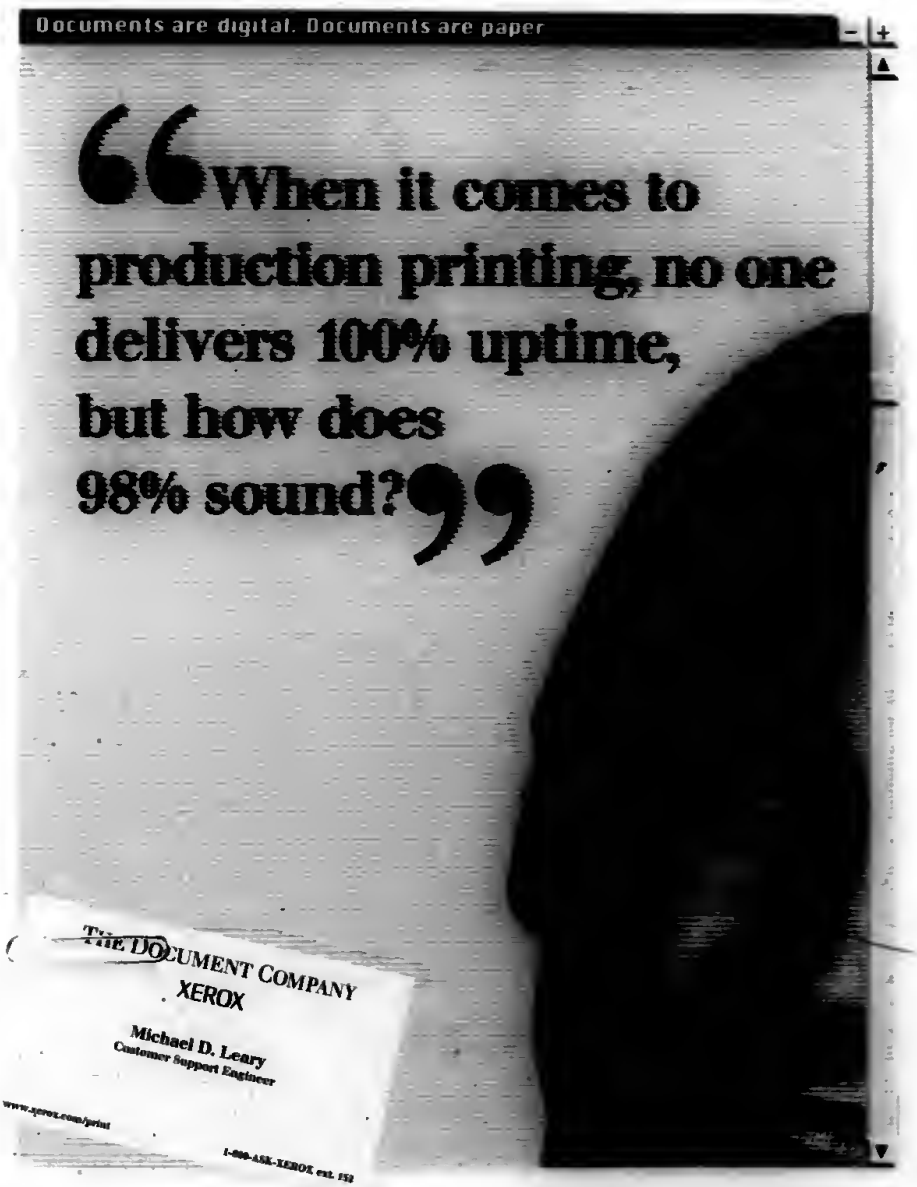

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Slow start for online purchasing

▸ *Most users have higher-priority concerns*

By Carol Sliwa

ARMED WITH the ability to buy supplies and services through electronic catalogs, some companies expect to log dramatic savings through the use of procurement software packages on their intranets and extranets.

But although a few large companies such as MasterCard International, Inc. are starting to implement such systems, industry analysts estimate there are no more than 30 companies undertaking that process now. Adoption will remain slow as information technology staffs wrestle with more pressing year 2000 problems, industry observers said.

Dataquest pegged the procurement software market at a mere $12.9 million last year. In a soon-to-be-released study, the San Jose, Calif., research firm predicts only moderate growth, to $360 million by 2002, said analyst Erina DuBois.

"This is definitely small compared to other [software] applications," DuBois said.

Some analysts think it will take a few big, successful installations to jump-start the market. The software is so expensive and complicated to install that, so far, it has been a realistic option mainly for large corporations with sizable assets.

Canadian Imperial Bank of Commerce (CIBC), for instance, spends $864.7 million per year on supplies and services.

Eventually, the bank hopes to save as much as $60.5 million annually by having employees buy through its intranet system from Ariba Technologies, Inc., said Jack Miles, the Toronto-based company's chief purchasing officer.

REDUCING PAPER

The procurement system can save money by reducing paperwork, improving accuracy and streamlining processing. But Miles said the biggest savings will come from the buying-activity reports that can help CIBC negotiate better deals with suppliers and enforce policies with employees.

CIBC will spend millions on the project, which includes installing a new PeopleSoft, Inc. system for back-end processing. It expects the rollout to take 18 to 20 months and the payback to come in 24 to 36 months.

"It takes time. It takes money. It takes effort," said James Cullinan, vice president of global purchasing at one early adopter, MasterCard in Purchase, N.Y., which spends $200 million annually on purchasing.

MasterCard wants to make sure its employees can do one-stop shopping under a global purchasing umbrella rather than clicking on several World Wide Web site icons for various purchases. "We want to make sure it's very easy and becomes the tool of choice through little choice," Cullinan explained.

He said MasterCard is saving 15% with electronic purchasing now, but the eventual savings are still too difficult to predict.

Officials at John Hancock Mutual Life Insurance Co. project savings in the neighborhood of $20 million once employees start doing 85% of their purchasing through an intranet system.

But it will take some work to get there.

Hancock has to integrate its Netscape Communications Corp. BuyerXpert procurement package with both its PeopleSoft human resources system and its Geac Computer Corp. SmartStream enterprise resource planning software for back-end processing, said Roy Anderson, the company's corporate purchasing director.

Hancock has IT, accounts payable, human resources, finance, purchasing and electronic data interchange departments all involved in the project, plus Netscape professional service staffers, said technical project manager Vaughan Osmond.

Because of the cost and complexity, many analysts think some companies are more likely to consider other alternatives, such as outsourcing the function entirely.

The Internet is also likely to play an increasing role in electronic procurement, said Vernon Keenan, a principal at Keenan Vision, Inc. in San Francisco. He cited Netscape's NetCenter attempt at a business portal site as one example.

But users said those external alternatives may not provide the true benefits of a procurement system. "Your ability to extract facts and data on buying activity is fairly limited," Miles said. □

Notes gets unified data searching

By Roberta Fusaro

LOTUS DEVELOPMENT CORP. last week shipped Domino Extended Search, an add-on to its Domino server that will let users search across Notes databases, relational databases and the Internet from a single point of access.

Domino user John White, a senior manager for groupware at JPH International, Inc., an applications developer in Waterloo, Ontario, said the add-on would let his company extend its range of applications more easily through a unified front-end search engine.

"We're definitely looking forward to it," White said.

Domino Extended Search works with Release 4.5 and higher on Windows NT. It lets users search simultaneously across distributed and relational databases and the World Wide Web.

It compiles a single, ranked hit list of information sources that can be saved and shared with other users throughout a company.

The add-on opens up users to other kinds of data besides that contained in Notes databases, said Hadley Reynolds, an analyst at Delphi Group, Inc., a Boston-based research firm. And being able to share search results with other users in a company can improve productivity, he said. (Domino currently limits user searches to Notes databases.)

SEPARATE INDEX ENGINE

The product doesn't have an indexing engine; it searches indexes created by a Verity, Inc. indexing engine, which must be purchased separately.

Lotus will announce connectors to other indexing engines later this year.

The product is one of a series of Domino extensions Lotus plans to release this year to add knowledge management capabilities.

The add-on costs $3,995 for a server with one to four processors and $9,995 for a server with more than five processors. Client licenses cost $30. □

Meta-data, warehouse tools debut

By Stewart Deck

VENDORS AT last week's Data Warehouse World exposition in New York showed off a variety of new and updated tools that covered a range of technology, including data analysis, meta-data management and data extraction and migration.

DATA WAREHOUSE WORLD EXPO

Information Builders Inc. has begun to ship WorldMart for Sales Analysis, a tool that lets users look into customer and product sales performance and optimize sales and marketing efforts. It lets users view patterns, look up transactional sales histories and get product information by time period, customer, organization and product line.

The New York-based company also announced SmartBase, a meta-data management tool that integrates Information Builders' SmartMart tool kit with meta-data repositories. Distribution of SmartBase will begin in October and will include a driver for Microsoft Corp.'s Repository 2.0. It will have tools for data extraction and transformation, modeling, and data warehouse monitoring and management.

Ardent Software, Inc. in Westboro, Mass., unveiled DataStage 3.1, a data extraction, transformation and migration tool. The latest version includes enhancements to its meta-data import/export features as well as its meta-data integration with the Microsoft Repository and Sybase, Inc.'s Warehouse Studio. It also has new plug-in stages for Oracle Corp.'s Oracle8 database that were designed to help the database run faster.

Pilot Software, Inc. in Cambridge, Mass., announced the release of Pilot Decision Support Suite 6.0, the latest edition of its online analytical processing suite.

New tools focused on data analysis and meta-data management.

The newest version lets users view analyses saved in an electronic briefing book, has new graphical administration tools, features new quadrant analysis capabilities and includes the ability to analyze results in multiple dimensions at the same time. Pricing starts at $40,000.

The Vantive Corp. was in New York to talk about its mid-June purchase of Wayfarer Communications, Inc. and its World Wide Web-based information delivery tools. Vantive plans to blend those tools with its own automated sales, marketing and call-center software.

A new product, VantiveVista, will result from that combination and will let users view real-time information collected from both front- and back-office applications along with corporate intranet and Internet sources.

No exhibition is complete without a bit of Web-enablement. **Hummingbird Communications Ltd.** unveiled BI/Web, a business intelligence tool that lets users perform a number of query and reporting tasks using their Web browsers. □

PeopleSoft pressures SAP in app market

By Craig Stedman

PEOPLESOFT, INC. used to be ooly too glad to dance around SAP AG. Now it is increasingly locking horns with the applications market leader.

Both PeopleSoft and SAP have been busy filling product holes that kept them separated before. For example, PeopleSoft lacked maoufacturing software until last year and didn't support global users until this spring. And SAP is upgrading its human resources applications this year to try to reduce PeopleSoft's lead in part of the market.

HEAD-TO-HEAD

Comparing SAP and PeopleSoft

	Strengths	Weaknesses
SAP	• Size and market leadership • Quick to embrace and develop new technology	• Seen as autocratic by some users • Managing growth could become difficult
PeopleSoft	• Good relations with users • Momentum from rapid sales growth	• Lags on technology adoption • Lack of international presence

Source: Hurwitz Group, Inc., Framingham, Mass.

Analysts said PeopleSoft's rapid growth — revenue shot up 77% in the first half of this year — is giving it a shot at becoming the top alternative to market-leading SAP. Helping PeopleSoft's cause is the fact that Oracle Corp.'s application sales have gone flat and The Baan Co. is overhauling its management and trying to ferid off criticism about sales to some of its resellers.

SAP still has about three times the market share of PeopleSoft, and its revenue grew in the first half by 61%. But PeopleSoft has become the competitor that SAP worries about the most, said Jim Shepherd, an analyst at AMR Research, Inc. in Boston.

PROPER RESPECT

"All signs point to PeopleSoft being a solid No. 2 vendor," Shepherd said. "And SAP has far more respect for PeopleSoft than they do for Oracle or Baan."

International Data Corp. in Framingham, Mass., ranked PeopleSoft as the No. 2 applications vendor by a slim margin over Oracle last year. AMR still had Oracle ahead, but Shepherd said he expects PeopleSoft to take over the second spot this year.

For some users, it wasn't always like this. JBL Professional, a subsidiary of Harman International Industries, Inc. that makes sound equipment for professional uses, quickly passed over PeopleSoft when it was shopping for packaged applications three years ago.

"I thought PeopleSoft was more of a human resources product than anything else," said Dennis Barry, vice president of finance and administration at JBL. The Northridge, Calif., company needed a full set of applications with international support and ended up buying SAP's R/3 software.

JBL has run finance, sales and other operations on R/3 since 1996. Barry said he expects to go live with SAP's manufacturing software next month.

But Corning, Inc. waited for PeopleSoft to flesh out its applications with manufacturing support after first buying the Pleasanton, Calif., vendor's finance and human resources software.

PeopleSoft's manufacturing and supply-chain management applications went into use at two of Corning's 10 business units last month, said Rick Beers, a strategic process leader at the Corning, N.Y., manufacturer. The ability to influence developmeot of the software was a big plus for Corning, he added.

"We took a bit of a risk [by going] with PeopleSoft, but we think they took a bit of a risk with us too," Beers said. "It was a bit like a marriage." □

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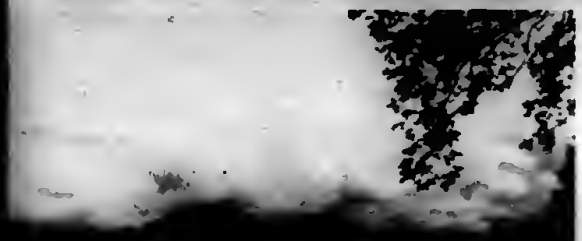

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European Union Directive: It's no joke

▸ *Privacy standards must be met for U.S. firms to do business abroad*

By Laura DiDio

ATTENTION U.S. COMPANIES doing business abroad: The European Union Directive on Privacy Protection takes effect Oct. 25.

After that date, companies operating in any of the 15 EU nations can't move personal data — information about their employees or customers — back to the U.S. for data processing or administrative review unless the U.S. and the individual companies are deemed to have an "adequate" level of privacy protections in place.

U.S. businesses must upgrade their security policies, data centers, procedures and enforcement mechanisms and allow inspections by European regulators — or face the consequences.

The penalties include suspension of business in EU member nations and the risk of lawsuits, said Susan Nycum, a partner at Baker and McKenzie, a Palo Alto, Calif., law firm.

Only about 10% of U.S. businesses, mostly large corporations, have addressed the EU directive, said Alan Westin, president of Privacy & American Business, a nonprofit organization in Hackensack, N.J.

"The other 90% are going to have to wake up and get cracking," Westin said. "Many U.S. businesses mistakenly believe that the Europeans can't be serious about this."

Privacy & American Business' Alan Westin: "Many U.S. businesses mistakenly believe that the Europeans can't be serious about this"

Multinational companies such as Citicorp Credit Services, Inc. in New York and Equifax, Inc. in Atlanta faced the issue head-on years ago.

Citicorp, for example, adopted strict compliance with German privacy laws when it began issuing its Bahn credit card four years ago, said Joan Warrington, general counsel and vice president at Citicorp's credit-card unit.

JUST COMPLY

"Germany has strict privacy rules, and we had to come up with a model contract to ensure privacy. The Germans were initially skeptical, but their data protection officials were very willing to work with us, and we brought them over to tour our sites," Warrington said.

Citicorp also fully disclosed to its German customers and employees their rights in the U.S. and their ability to sue over any breach of privacy. "It took our legal department several months to hammer out the contract. It's paid off for us," Warrington said.

John Ford, vice president of privacy and external affairs at Equifax, made similar moves as far back as the late 1980s.

He is stepping up the company's EU compliance efforts because "we're expanding our European business. Privacy is not only the right thing to do, it makes good business sense," Ford said.

Privacy & American Business is sponsoring a seminar this week to coach companies on how to implement privacy policies and draft model privacy contracts.

"This is the eleventh hour," Westin said. "If companies don't comply with the EU directive, they may not effectively do business in Europe, they won't be able to manage their global personnel, and they won't be able to intelligently plan their intranet, extranet and Internet activities. That doesn't leave much else."□

How to keep a basic level of compliance with the European Union Directive on Privacy Protection:

- **Know what information is being collected**
- **Disclose to consumers how the information will be used and where it's being sent**
- **Tell customers and employees their legal rights**
- **Find out which employees have database access**
- **If any data is transferred outside the country, register the data transfer, describe the nature of the data and get approval from the originating country**
- **Work closely with individual EU member nations because rules may vary by country**

Weak browser support limits Java

By Carol Sliwa

GROWING NUMBERS of corporations are using Java, but more often than not, that means server-side Java.

Although many would like to use client-side Java in World Wide Web browsers, few can even consider it for Internet-accessible applications. And even in more controlled intranet or extranet settings, corporations can't always be sure what browser end users are running.

The impediment? The inconsistent level of Java support in the major browsers, said John Melka, a senior systems engineer at NationsBank Corp.

Melka, who spoke at Internet World last month, was among several users who recently discussed Java's limitations on the client.

NationsBank's global finance division in Chicago uses Java for complex financial applications. But the company delivers those intranet- and extranet-based applications to end users via Hypertext Markup Language (HTML) and JavaScript.

"In a server-side situation, you have control over the Java virtual machine. In a browser, you could be talking to anybody. It's whatever they happen to load," Melka said.

"We specify what we want for a browser on the desktop, and it takes a certain amount of time for it to get there. Because of that, you don't have what you think you have," he said.

FIREWALLS SCREEN JAVA

Firewalls are a greater concern for consulting firm Ernst & Young LLP. The company's Advanced Development Center in New York is creating an application that will let Standard & Poor's corporate clients get financial risk assessment ratings and related articles via Internet browsers.

But, if Ernst & Young wrote the client in Java, many end users might not be able to download the applets. So the company opted for HTML.

"A lot of large corporations, especially investment banks, screen out Java applets through their firewalls," explained Joseph Larizza, a senior manager at the center.

CompHealth, Inc., a medical staffing concern in Salt Lake City, wrote a complicated Java application that will give doctors an Internet option for filling out the forms needed to verify their credentials.

NationsBank's John Melka: "I think Java would allow us to do things in a much more reusable manner"

Because the multiple forms take time to complete, CompHealth wanted an application that doctors could easily navigate with pull-down menus and that would let them pick up where they leave off if they didn't have time to finish.

OLD BROWSER ISSUES

CompHealth chose Java for the client because it didn't want doctors to have to flip back and forth between HTML pages. But Redge Cook, senior director of information services, said the company may have to tell doctors which browsers to use.

"There are issues with the older browsers," Cook said, noting that so far, the application is more stable on Microsoft Corp.'s Internet Explorer.

Dynamic HTML and the Extensible Markup Language will be future options, but none of the browsers now supports those technologies.

With uneven Java support in browsers from Netscape Communications Corp. and Microsoft, some companies have been working around the problem by writing Java clients that run outside the browsers.

"But even if you write a Java application, you still need a Java virtual machine to run it — unless you want to compile it to native code," said David Nagel, a senior technical adviser at Cummins Engine Co. in Columbus, Ind.

Still, Larizza said he thinks there is great potential for browser-based applications to use Java because users wouldn't have to worry about application delivery or compatibility with other desktop applications.

"For us, I think Java would allow us to do things in a much more reusable manner," Melka said. "That, for me, would be the biggest hit from the get-go."□

Java: Out in the cold

The browser had been a convenient mechanism to deliver the Java virtual machine (JVM) necessary to compile applications, but Netscape and Microsoft support is uneven, users and analysts said.

Netscape, which no longer will make the JVM, has worked on an Open Java Interface for third-party vendors to plug in their JVMs. But Netscape hasn't announced any third parties to support all 16 platforms on which JVMs run.

Microsoft plans support for the latest JVM in its new Internet Explorer browser. But lacking support for the Java native interface subclass, Microsoft's version won't be fully compliant with the standard established by Sun Microsystems.

— Carol Sliwa

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Rising thefts lift laptop costs

CONTINUED FROM PAGE 1

the crime seriously.

A Visa U.S.A., Inc. executive was hospitalized recently when thugs beat him up in a hotel parking lot and took his laptop computer. "We tell our people to . . . valet-park now" as a result, said Allen Trosclair, former vice president of security at Visa in Foster City, Calif.

When a laptop is reported stolen at Citicorp, internal security investigates the employee first because so many thefts are inside jobs, said Michael Scialabba, vice president of investigations and fraud prevention at Citicorp in New York.

Arthur Andersen & Co. in Chicago shows new hires a 20-minute video about how to protect against theft and requires all users to cable their laptops to desks while at work.

"Once these computers are stolen, we are recovering almost none of them. There are so many opportunities out there to sell them," said Denise Gill, a detective at the Montgomery County Police Department in Bethesda, Md.

JOHN MABERRY

BIG BUCKS

Companies insured by Safeware, The Insurance Agency, Inc. in Columbus, Ohio, reported more than $1 billion worth of claims for stolen laptops last year — a 28% jump from 1996 (see chart, top corner). According to the Technology Theft Prevention Foundation, an average of one laptop per week is stolen from hotels and the convention center in Santa Clara, Calif., a hot spot for industry conferences.

It's hard to know the full extent of the crime because many thefts go unreported. Plus, most police departments lump theft of laptops in with other stolen-property crimes. But interviews with police, industry groups and security officers at user companies reveal an ugly picture.

Recent incidents include the following:

- A major airline saw 22 of its Toshiba Corp. laptops, worth $75,000, disappear one night in October when thieves used glass cutters to enter the ground-floor office. Insurers paid the claim, but investigators have no leads.
- In Tennessee, armed robbers held up a truck driver bound for an Ohio retailer in December, snaring 350 laptops worth a total of $770,000. Forty-nine Apple Computer, Inc. laptops were later recovered when three men trying to sell them in Memphis caught the eye of police. The rest are still missing.

Single robberies such as the one the Visa executive experienced are usually by lone hoodlums looking for something to sell for fast money, said Paul Malchow, a detective at the Calgary Police Department in Alberta. "I've been involved in investigations of [someone] stealing a laptop for two hits of crack," Malchow said. The drug dealer makes out well, getting a $2,000 or $3,000 computer for the equivalent of $50 worth of drugs, he added.

But a recent six-week string of office thefts in Calgary was quite different.

In that case, 81 laptops were stolen from several buildings in a five-block area. Four thieves would enter a building at lunchtime, dressed in suits and looking for unattended laptops to stuff into briefcases. "These individuals were bold. They would go out the back stairwell, dump them and go get more," Malchow said.

Undercover officers eventually learned how well-planned the operation was. The four "seeds" would meet each morning at a nearby restaurant to chart the day's heists with two men who fenced the stolen goods to buyers. They would regroup in the afternoon to exchange PCs for cash. An Intel Pentium-based machine brought a thief up to $500, Malchow said. He and his team ultimately recovered $60,000 to $70,000 worth of the stolen computers — some in the back seat of a stolen car — and made four arrests.

California passed laws recently that make it a crime to buy computers the buyer knew or should have known were stolen.

"Look, if you receive an NEC laptop with 2G bytes of memory and a CD-ROM drive for $400 when it should go for $2,000 to $3,000, you're subject to consequences, such as going to jail," said Lt. Steve Ronco at the San Jose Police Department in California.

"We had to [pass the law] because of the enormity of what we're facing," said Rooco, who leads the High Tech Crime Unit at the department.

POLICE WANT HELP

Police are frustrated with victim companies that don't provide helpful information such as serial numbers or that let the trail go cold by not reporting the crime right away.

Another obstacle is laptop makers that won't take extra pains to deter theft by, for example, shipping their products in plain, unmarked packages or etching serial numbers in several places on the machines and components. Used-computer broker Robert Zises has tried to persuade hardware companies to cooperate, with little luck.

"They look at it like it's one more operation they would have to do that consumers probably wouldn't pay extra for," said Zises, who created the Stolen Computer Registry database (*www.nacomex.com*).

But buyers are paying extra whether they know it or not. That is mainly because cargo theft has increased substantially in the past few years, said Marylu Korkuch, a technology insurance expert at Chubb & Son, Inc. in Washington. Hardware makers hit by truck heists face those losses as well as the cost of shoring up security afterward. Sometimes, as in an incident in Irvine, Calif., last year, the firms must pay medical bills for drivers hurt by thieves.

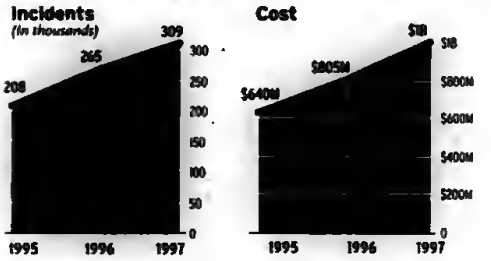
As a result, the price of an average laptop is inflated by about $150, Korkuch said. "All those costs find their way back to the consumer." □

Sampling of devices to protect your laptop from thieves

Communications software that secretly dials a monitoring service when a thief connects to a modem line	**Absolute Software Corp.** *Vancouver, British Columbia*
	Computer Sentry Software, Inc. *Franklin, Tenn.*
Cable-and-lock sets	**Computer Security Products, Inc.** *Nashua, N.H.*
	Kensington Microwave Ltd. *San Mateo, Calif.*
Motion-detector alarms	**Lotsa Gadgets, Inc.** *Winter Park, Fla.*
	Port, Inc. *Norwalk, Conn.*

STICKY FINGERS

Laptop theft claims topped $1B last year for one major computer insurer; thefts are expected to increase again this year



Source: Claims data from Safeware, The Insurance Agency, Inc., Columbus, Ohio

Hold on to that case

Airports are a well-known hangout for laptop computer thieves. They often like to duck by X-ray machines to switch computers off the conveyor belt before an unsuspecting victim can pass through.

Three more airport-theft ploys have popped up recently, according to police:

- A thief carries an ordinary computer case with a flash or other bauble, then swipes by a bank of pay phones for a careless target. When the victim sets his case down to dial, the thief switches the bags. Police advise laptop owners to place cases firmly between their ankles when on the phone.
- A team of thieves poses as a family. While the "husband" and "wife" stage a loud fight to distract the target, a fake son or daughter moves in and walks away with the laptop. Advice? Mind your own business.
- Another team poses [illegible] when a study showed women drops a [illegible] while walking to a target. When the [illegible] goes to pick it up for her — or with himself — the [illegible] steals the [illegible]. Again, [illegible]

— Gillian S. Mosh

Pentagon to deploy huge medical data warehouse

By Matt Hamblen

IN JANUARY, the U.S. Department of Defense plans to deploy what officials say is the largest known medical data warehouse — a mother lode that could benefit the health care industry, too.

The data warehouse will hold the medical records of the 8.5 million active members of the U.S. military health care system who are treated at 115 hospitals and 461 clinics around the world.

In 1995, the Defense Department began converting its fixed-cost health care system to a managed-care model to lower costs and increase patient care for the active military, retirees and their dependents. The managed-care model is supported by a $450-million medical data warehouse called Computerized Executive Information System (CEIS).

The project has eliminated 14 redundant systems at a savings of $50 million per year, officials said.

System architect Mike Mauro: Drugmakers "already want our data"

Eventually, the Pentagon hopes to store 20 years of data and track the best treatment for various ailments, from drugs to treat malaria for black males aged 35 to 40 to tests to detect breast cancer in white females aged 40 to 45, a CEIS official said.

That's the kind of long-term, large-sample knowledge base that private medical researchers, insurance companies and drugmakers are itching to get their hands on. The Pentagon eventually will offer, and possibly sell, such historic aggregate data to the private sector, system architect Mike Mauro said.

"Health care researchers will want to use the data warehouse to see how drugs work with different demographic groups, and drug manufacturers already want our data," Mauro said.

CEIS officials have swapped notes with Henry Ford Health System in Detroit, a private managed-care system. "We're sort of learning from each other about what the problems are in designing databases," said Jim Chesney, director for policy research at Henry Ford.

CEIS is expected to go live in January with 4T bytes of data covering six years. It will be used by 12,000 doctors, nurses and administrators, Mauro said.

Patients and CEIS's creators said they are concerned about the privacy of individual medical records in the system.

"Any kind of large database like that where you talk about personal info raises red flags," said Alex Fowler, a spokesman for the Electronic Frontier Foundation in San Francisco. "There are all kinds of questions raised about who accesses that info or protects it and how somebody fixes mistakes."

CEIS uses an online analytical processing tool from Business Objects, Inc. in San Jose, Calif., that could be used to restrict access to certain data, such as HIV test results, said Frank Gillett, an analyst at Forrester Research, Inc. in Cambridge, Mass.

"What kills these huge data warehouse projects is that the human beings don't agree on the definition of data. Without that . . . all that $450 million could be thrown out the window," he said. □

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Thin clients

DEFINITION: Thin client is an umbrella term for a simple hardware device that usually doesn't have a hard drive, CD-ROM drive or expansion slot. Thin clients rely on servers for processing power and for loading applications. Users can't load applications directly onto thin clients, so the devices require less maintenance and less help desk support and therefore cost less. There are various types of thin clients, including network computers and Windows-based terminals.

A simple, money-saving option for users with limited needs

By April Jacobs

THIN CLIENTS, also known as network computers, are one of the most confusing hardware developments because of the different forms they take.

Thin clients are PCs that rely on servers to harness their processing power, applications and data. They resemble terminals but aren't necessarily pinned to mainframes. Technically, thin clients must have a Java Virtual Machine, which allows read access to non-Windows applications and operating systems. The Java Virtual Machine is software that recompiles code, allowing it to run on a variety of hardware platforms. A thin client must also have a browser but needs no fancy peripherals such as floppy disk drives or CD-ROM drives.

AT ISSUE

Limited use for end users vs. cost savings

"The main attraction to network computers is simplified software upgrades, no real penalty in performance and longer desktop hardware life cycles," says Roger Kay, an analyst at Framingham, Mass.-based International Data Corp.

But the greatest benefit of thin clients might be that they are easier to administer and therefore require fewer calls to the help desk. And the bottom line is that these types of machines can save firms up to 26% of the total cost of desktop ownership, according to estimates from Gartner Group, Inc. in Stamford, Conn.

Gartner analyst Chris Goodhue says thin clients are likely to remain niche products but are valuable as terminal replacements.

Kay notes that another advantage is that users don't have to deal with network bandwidth issues because many systems send and receive only keystroke information rather than actual data.

Analysts say network computers are best used in customer-service centers or anywhere users need access to a limited set of applications and data.

The following vendors offer thin clients: IBM in Armonk, N.Y.; Network Computing Devices, Inc. in Mountain View, Calif.; Wyse Technology, Inc. in San Jose, Calif.; Boundless Technologies in Austin, Texas; Sun Microsystems, Inc. in Mountain View, Calif.; and Oracle Corp. in Redwood Shores, Calif.

Microsoft Corp. and most of the major PC makers have come out with an answer to the thin client. The NetPC is a PC that can be locked to prevent users from physically altering its configuration. Such machines differ from true thin clients in that they process data locally instead of on the server.

Microsoft's Windows Terminal is another type of thin client. The Windows Terminal doesn't meet the specifications for a network computer because it has no local Java Virtual Machine and is dependent on Microsoft's Windows Terminal Server operating system. With Windows Terminal Server, code-named Hydra, users can gain access to Windows applications that reside on servers and operating systems through Citrix Systems, Inc.'s MetaFrame software. All processing takes place on the server, with the user's screen acting as a graphical user interface. □

MEAN NUMBER OF DESKTOP MACHINES AT LARGE COMPANIES IN 1997

PCs with Windows 95	351.7
PCs with Windows 3.1 or 3.11	145.9
PCs with DOS	73.4
Thin clients	23.5
Macintoshes	78
PCs with OS/2	8.7

Base: 200 companies with more than 1,000 employees

Source: International Data Corp., Framingham, Mass.

WHAT'S THE DIFFERENCE?

Windows-based terminal: A device that harnesses all its application and processing power from the server. It runs the Windows Terminal Server operating system to give users access to Windows applications. Non-Windows applications can be accessed through MetaFrame add-on software from Citrix Systems.

NetPC: A PC without a floppy drive or CD-ROM drive. It also has a locked-down chassis to prevent users from altering the machine. It is basically a stripped-down PC that can do local processing without the support hassles of a full-blown PC.

Network computer: It has a Java Virtual Machine and a browser. It can have local processing power.

VENDOR	PRODUCT	TYPE OF DEVICE	CHIP	MEMORY	BEST SUITED FOR
IBM	Network Station Series 100, 300 and 1000	Network computer	PowerPC	8M to 64M bytes	A variety of applications, from terminal replacement to intensive Java applications
Sun Microsystems, Inc.	JavaStation	Network computer	100-MHz MicroSPARC	Up to 64M bytes	Java-based applications
Boundless Technologies	Viewpoint TC200	Windows-based terminal	133-MHz 5x86	4M bytes	Windows applications

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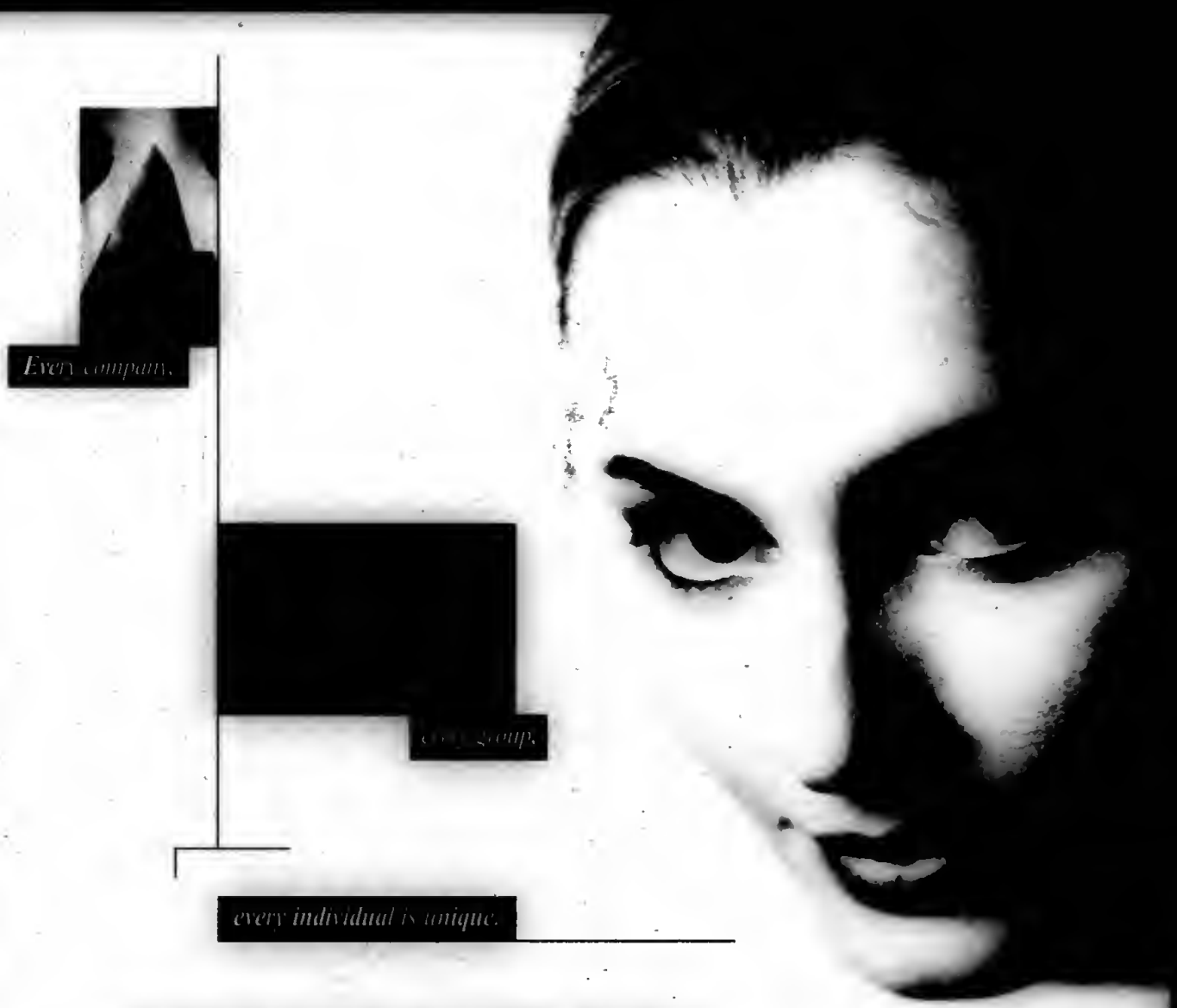

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OPINION

Buggin' out

Welcome to the summer of our software discontent. We are being swarmed by bugs and stung by careless coding. The latest example is last week's widely publicized E-mail system screwup, which affects Microsoft Outlook 98, Outlook Express and Netscape Communicator (see story, page 4).

In an ugly new irony, an E-mail message with an attachment — made possible by the latest Multimedia Internet Mail Extension (MIME) protocol capabilities — can fire a destructive piece of code into your network. You don't even have to click open the message to launch the attack. The wonders of technology have brought us to the point where merely moving the mouse and highlighting the file name can do the trick.

Naturally, Microsoft and Netscape raced to post the fixes for this bug — officially called the "long file name mail vulnerability" — on their respective Web sites. That's the Internet Age equivalent of closing the barn door after millions of horses have fled. How many business users will take the time to hunt up and download that fix?

These flaws in the Microsoft and Netscape products aren't even new mistakes, as any longtime programmer can tell you. The security risk of "buffer overflow" in coding is so well-known that there are automated hacker tools available to check for it and exploit it. But these products are big and the competitive time-to-market window is small, so vendors rush their heavily loaded programs out at slapdash speeds. They serenade us with enough bells and whistles to drown out any nagging doubts about the higher risks involved now that our company networks lay open and vulnerable to the world.

Yet another part of the problem is our own quest for ease of use at the expense of tighter security. We push technology to perform unnatural acts, such as sending a variety of attachments ill-suited for Internet E-mailing. A far safer practice would be to send a text message and include a URL address, leaving that fancy attachment sitting safely on a Web server elsewhere on the 'net.

But who will sacrifice convenience for safety? Maybe the answer is in that next E-mail attachment.

Maryfran Johnson, executive editor
Internet: maryfran_johnson@cw.com

LETTERS

Companies should look at the person, not the GPA

AFTER READING your article, "Diary of an IT grad" in *Computerworld*'s June 22 issue, I just had to write.

Over the past year and a half, I've read numerous articles in various publications boasting about the great salaries and jobs available for recent IT grads.

The only problem they all fail to mention: To benefit from these great opportunities, you need to be in the elite group of graduates with a minimum GPA of 3.5 and above.

But there are too many factors that can affect a person's GPA, such as family obligations, working full time, health and so on.

I am not just saying this because I no longer belong to this elite group, but mainly because I feel it is totally biased.

Companies are missing out on a tremendous amount of great talent because they just can't see past the numbers.

I'm a senior graduating in December with a bachelor of science degree in computer science and a GPA of a mere 2.7.

Although I have been looking for employment after graduation in the Minneapolis area, I have yet to have any success.

I think I speak for a majority of soon-to-be IT graduates when I say that if companies are looking for new, talented and diverse employees, they need to first learn to look past the numbers and take a closer look at the person.

Valayia J. Smith
Minot Air Force Base, N.D.
vjsmith@technologist.com

What was really behind Microsoft's SoftImage sale

COMPUTERWORLD wrote about Microsoft's sale of SoftImage to Avid ["Avid buys Microsoft animation division," CW, June 22] but failed to note the true significance of it. In 1994, when Microsoft purchased SoftImage, anyone in the higher end of the computer graphics business would have laughed themselves silly at the notion of doing graphics on Windows NT. Microsoft made it quite clear that it had purchased SoftImage to ensure that SoftImage's leading package of *Jurassic Park* fame was running on Windows NT.

> Microsoft made a profit on the company and drove NT into the graphics arena.

Silicon Graphics responded by buying the other two major vendors to ensure they never ported to NT.

But over the last six months, there has been a veritable stampede by high-end graphics developers to make hardware and software packages for the NT workstation.

Microsoft pulled off a real coup with this one. It made a profit on the company and drove NT into the graphics market, so of course they don't need SoftImage now.

This is one "predatory" behavior of Microsoft's I happen to like, because I use NT and I develop graphics software and I really want a market!

Mark Mullin
Founder, Draco Cybersystems
Lebanon, N.H.
mark@dracosystems.com

IT pros are finally getting paid what they're worth

YOUR FRONT-PAGE story ["$40,000 starting salaries," CW, June 22] informs us about $40,000 starting salaries for information technology grads and how this "unbelievable" wealth is wreaking havoc on existing pay scales.

Havoc?

That depends on your point of view.

IT professionals are finally starting to be paid what they are truly worth.

Technology services have long been priced very close to the cost of production, because, in large part, IT professionals truly love their work.

The benefits that the economy has derived from their work far exceed what they have been paid.

Top corporate executives, bankers and lawyers have no trouble justifying their multimillion-dollar salaries and bonuses.

We need IT professionals far more than we need them.

John Kjellman
Henniker, N.H.
johnk@victorex.com

Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

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analysis. planning. renovation. and testing:

Year 2000 Solutions at Work

SEEC

The Smart Change Factory®– SEEC's Year 2000 Enterprise Solution

The number of COBOL applications operating around the globe is staggering and within the US, these applications represent an asset comparable to our country's oil reserves. Now the challenge many companies and their IS organizations face is the remediation of these systems, which must function accurately when the millennium rolls over. Mission-critical COBOL applications must be either replaced or renovated, but most companies are finding that there is not enough time to replace them unless these projects are already underway. The year 2000 deadline is immovable and, when time for post-renovation system testing is taken into account, the time remaining for renovation is significantly lessened.

Most year 2000 compliance projects consume at least 10-30 man-years of effort and this number is substantially larger for the top 100 IS organizations. With Gartner Group estimates that the cost for year 2000 compliance will be between $300 billion and $600 billion, IS organizations must find a highly-efficient solution for finding and fixing the year 2000 problem. SEEC's software products and solutions can help reduce renovation time dramatically, delivering a comprehensive solution that has already helped companies renovate and put code back into production.

Year 2000 Conversion

Resolving the year 2000 problem typically requires the modification of many diverse software components, including programs, job control languages, query languages, screens and mapping databases and utilities. The detailed assessment, planning, remediation and testing process of a year 2000 conversion project is repetitive, labor-intensive and error-prone, particularly if performed manually on a line-by-line basis. In addition, each hardware operating platform has its own unique set of software components and typically encompasses multiple languages and interfaces between various applications. The difficulty in addressing the year 2000 problem is compounded by the fact that many organizations and third party service providers have only a limited number of individuals with the project management and technical expertise to conduct a year 2000 conversion project. Given the size, scope and technical complexity of the year 2000 problem, many organizations have concluded that they will be unable to address year 2000 conversion requirements in a timely manner utilizing existing internal resources and traditional maintenance and redevelopment methodologies. Many organizations may also find it difficult to outsource year 2000 conversion projects, since many third-party service providers are facing similar resource constraints. These organizations are seeking solutions that can be used internally or by third-party service providers to increase efficiencies and reduce the expense of a year 2000 conversion project.

SEEC's Year 2000 Enterprise Solution

SEEC provides year 2000 conversion solutions through its Smart Change Factory™. The Smart Change Factory combines SEEC's proprietary software products, including SEEC COBOL Analyst 2000™, SEEC Smart Change 2000™ and SEEC COBOL Slicer™ with well-defined methodologies and third-party software products to provide a comprehensive and integrated solution for year 2000 conversion. The Smart Change Factory is designed to address all phases of a year 2000 project, including assessment, planning, remediation and testing. The Smart Change Factory is designed to accurately analyze and determine which applications require remediation and automate certain portions of the analysis and remediation process. A year 2000 conversion process consists of four phases: inventory and impact assessment, planning, source remediation and testing.

1 Inventory and Impact Assessment Phase

This phase involves a comprehensive evaluation of a legacy system assisted by SEEC's software products to identify the applications, programs, files, databases and external interfaces that are or may be affected by the use of two-digit date fields. An assessment is then made of potential program or system failures that may occur, the programs that must be corrected and the cost and timing of implementing required corrections. The information developed in this phase is then used to create a set of technical reports identifying in detail affected programs, data items, logic statements and a preliminary estimate of remediation and testing budgets.

2 Planning Phase

The planning phase involves analysis of the data generated in the impact assessment phase in order to generate a comprehensive plan for implementation of the remediation and testing phases. This phase is critical to developing an efficient remediation and test phase plan to minimize expenses and efficiently utilize existing information technology resources. Under the Smart Change Factory approach, SEEC's software products are utilized to assist in determining the most appropriate year 2000 remediation approach, including program logic changes or date field expansion. In the planning phase, a determination is made whether particular programs should be phased out, replaced, redeveloped or remediated.

3 Renovation Phase

Source renovation involves accurate detection of date fields and their formats. The code modification is based on the solution— date windowing or field expansion. Date windowing involves logic changes in the program to interpret the date values accurately based on the date pattern usage while field expansion involves expanding the fields to include or contain the century component of the date value. SEEC Smart Change 2000 detects and tags all statements that need to be modified. It also suggests the appropriate rule to be applied on those statements, using the rule specification supplied. These rules can be customized to achieve an even higher degree of automation accuracy. The product lets you review the tags before any modifications are applied, and affected statements not covered by a rule have to be fixed manually. All modifications to the source code are documented for future audit and review. The product enables field expansion and windowing to be applied within the same program for different date fields. The modifications for bridging can be generated automatically by framing rules as dictated or required by the bridging product.

4 Testing Phase

Testing is the most time-consuming activity of year 2000 remediation. Establishing compliance means you must test all business functions that employ date logic and all of the source code changes that make them compliant. Any conventional "black box" or functional testing could result in a large number of tests and still may not cover all date logic. SEEC's AccuTest is a unique solution that combines "white box" testing techniques with the black box approach. It optimizes testing by minimizing the number of test cases while maximizing coverage. AccuTest is a comprehensive testing solution combining tools for program analysis and coverage measurement, capture/playback, test management and date simulation. The analysis tool analyzes the data and control flow in programs to suggest test cases. It also enables measurement of test coverage for existing functional testing and suggests test cases to improve coverage. The capture/ playback tool automates testing by recording and replaying test scripts, while the test management tool manages the overall testing process from planning to defect tracking.

SEEC enterprise solutions 1998

SEEC introduced COBOL Analyst 2000 for year 2000 analysis and the Smart Change Factory process in September 1995. In April 1997, SEEC introduced Smart Change 2000 and COBOL Slicer for automated source renovation and test preparation. The Smart Change suite of tools were derived from SEEC's core technology and the year 2000 functionality was added based on experience with customer projects in early 1995.

Since then, SEEC's products have been used at over 50 Fortune 1000 sites for year 2000 assessment and the Smart Change 2000 tool has been installed at five sites for source renovation. To date, over half a billion lines of source code have been analyzed using SEEC's technology, and over 20 million lines of code have been renovated and put back into production. SEEC pioneered the on-site factory concept and has partnered with companies like Wheeling Pittsburgh Steel Company and MACK Trucks to set up Smart Change Factories in-house. These companies are well on their way to total year 2000 compliance having completed the assessment and planning phases and some portion of the renovation and testing.

One of the key benefits that SEEC's tools and process have provided these and companies like them is a reduction in effort and cost by accurately identifying the affected date items and statements, and then further analyzing the affected statements to assist in the choice of the tactical solution — Procedural versus Windowing. The Smart Change approach has resulted in substantial savings to customers by reducing the number of programs and lines of code that must be renovated. Most SEEC customers have chosen the date windowing solution and, in these cases, the number of lines of code requiring renovation is less than 0.5%.

SEEC has pioneered the date windowing solution for year 2000 compliance. SEEC's process and tools identify the date operations that must be reviewed and, using a rule-based approach, suggest the appropriate fix to be introduced in the program logic. This approach greatly reduces the number of lines that need to be reviewed manually. In addition to improving the productivity in identification and renovation of code, it ensures a consistent and repeatable method of fixing the year 2000 problem.

The results from year 2000 analysis obtained using SEEC's tools at two organizations:

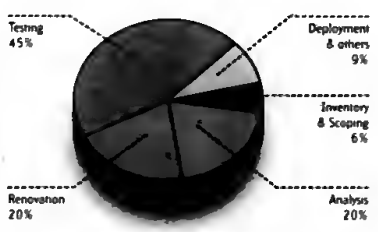
Company	*Total Programs*	*Size of Application Portfolio (total LOC)*	*Total Affected LOC*	*% Affected Impact*	*Total Affected LOC using Windowing*
Wheeling Pittsburgh Steel	8,485	12,809,341	951,650	7.4%	
MACK Trucks	7,555	6,435,210	374,968	5%	

Automated Renovation Metrics

Organization	*Programs*	*LOC*	*% Changes (made automatically)*	*Effort in Hours (including manual changes)*
University of Pittsburgh	177	264,000	97%	200
Anthem Insurance	265	700,000	95%	200

Most of the IS organizations within the U.S. have completed their year 2000 assessment and have begun the renovation phase; with renovation underway, year 2000 project offices and managers are now looking ahead to testing. The Gartner Group estimates that 45% of the year 2000 efforts will be spent on testing (*see chart at right*).

Year 2000 Project Effort



Source: Gartner Group, Inc.

The testing effort will exceed the assessment and renovation efforts combined. Therefore, any measures that organizations take to optimize the testing effort and improve the quality of testing will allow them to convert more systems in the time available.

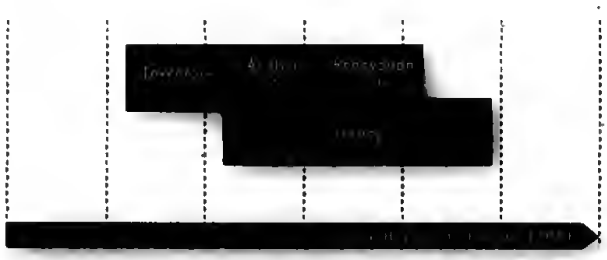
Unlike most other software projects, year 2000 projects have an immovable deadline that cannot be missed. This deadline need not always be the year 2000; it may be sooner if the systems operate on future dates such as expiry or maturity dates. Hence, the actual deadline is the date when systems are estimated to exhibit date-related abnormalities. This is often referred to as the Time Horizon to Failure or THF. Working back from the THF and taking into account the time needed for deployment and other emergencies, the systems must be renovated and tested well before their THF. If there is no overlap between renovation and testing, the time available may not be enough.

Fortunately, two very time-consuming phases of testing—test planning and test preparation—do not need to wait for renovation to be completed. These can proceed simultaneously with assessment and renovation so that the actual testing can begin as soon as renovation

continued on next page

% Affected LOC Using Windowing
5%
4%

Year 2000 Project Timeline



is complete *(see chart above)*. This allows more time for test planning and preparation, and if this time is used judiciously to improve the testing methodology and automate the tests, the testing effort can be drastically reduced. Also, test plans and scripts are assets well beyond the year 2000 and can be very useful during auditing.

The Goal

The objective of testing is to ensure that the systems are ready and compliant before their THF. Defects found after release are the most expensive to fix and—in the case of the year 2000 bug—present potential litigation problems. Software engineering practitioners know that up to 60% of all system modifications inadvertently introduce new defects (Source: Software Engineering Institute). Hence, the primary goals for testing are to:

- Complete testing of the systems before their THF
- Maximize the percentage of defects found and remedied
- Minimize the unintentional defects introduced as a result of renovation

Test Planning

Test planning is the most important year 2000 activity and the decisions regarding the testing methodology, test environment, tools, staffing and budgeting are made during this phase. The following steps detail the test planning process:

1. Prepare the test methodology

Estimate the testing effort and prepare a test methodology. You will need to determine the following: the test strategy, the tests and test data, what and how much will be automated, how defects will be reported, post-fix testing, and acceptance criteria.

2. Prioritize applications

An application's business value and its THF determine its criticality. They also determine the amount of testing and the order in which the applications will be tested.

3. Select the test environment

Determine whether a separate CPU, a logical partition or a test CICS region is the appropriate test environment. Perform capacity assessment to estimate the CPU and DASD requirements for testing. If the available capacity does not meet the requirements, plan to acquire additional hardware. Ensure that the test environment itself is year 2000 compliant and able to simulate future dates.

4. Choose testing tools

Evaluate and select the tools for testing. Verify that the tools are year 2000 compliant and are compatible with the test environment. Note that some tools will work only with certain versions of OS, CICS and other sub-systems.

5. Staff adequately

Staffing is a very important requirement and, depending on the time available, additional testers may be needed. If adding a new suite of tools, plan time for training staff. Plan for system administration and maintenance time to install new hardware and tools.

Test Preparation

Test preparation involves setting up the test environment and preparing test cases and test data. Test preparation requires extra thought because it is time consuming and may surprise you with unexpected results.

1. Set up the test environment

Ensure that the production environment is well-insulated from the test environment and that the data sets are not shared between test and production systems. Test the environment to ensure it is year 2000 compliant and is able to handle special dates such as February 29, 2000. If you plan to reset the system clock to simulate future dates, be aware of pitfalls such as expiration of data sets, licenses, user IDs and passwords. Resetting the system clock can affect system logs in databases that may be difficult to reset.

2. Prepare detailed test plans

Prepare detailed test plans to test each module and transaction. The test plan details the steps and the expected results.

3. Prepare test scripts and JCL jobs to automate testing

Plan to automate as much as possible. You can automate online testing using capture and playback tools.

For batch systems, you can use JCL jobs to run the application through different sets of test data. Automated tests offer the following advantages:

- They can be run repeatedly with the same level of accuracy, while manual testing may miss steps as testing personnel grow bored with the process.
- Test scripts can be customized to make the same script test different scenarios.
- Tests can be scheduled during off-hours.
- They can be used well beyond the year 2000.

4. Prepare test data

Based on the testing methodology and the volume of testing needed, test data must be prepared. One easy method of generating test data, which requires a large DASD, is a snapshot of the production data. Since tests will change the data, to test the base line repeatedly, save the initial test data andre store it before each test cycle.

Year 2000 tests are categorized as regression or baseline tests, compliance tests and acceptance tests. Regression tests ensure that the current functionality has not changed, while compliance tests ensure that the application will behave as expected in the 21st century. Acceptance tests ensure that any changes to the user interface did not affect its usability and year 2000 renovation did not significantly deteriorate performance.

Regression or Baseline Tests

The first and the most important test is the regression or baseline test. Since year 2000 renovation does not change the functionality, the converted system should behave exactly as the old one. The following steps describe how to conduct the regression tests.

- Prepare the test data.
- Create the baseline tests using the existing system. Save the results of the baseline tests (the modified data files, screen shots and generated reports). Collect statistics to measure the time taken for major operations and estimate DASD requirements. Note that none of the steps mentioned require the renovated source and can be done before renovation is complete.
- Make appropriate changes to the test data and scripts for the renovated system. If date fields have been expanded, then the test data and scripts will need to be altered accordingly. Tools are available to automate this process.
- When the renovation is complete, repeat the baseline tests on the renovated system. Compare the new results with the saved results. The comparison can be automated by using smart comparison tools that can examine expanded dates with unexpanded dates.

Unit or "Peephole" Tests

Whether or not unit tests are appropriate for year 2000 renovation is highly debatable. The primary purpose of a unit test is to make sure a program behaves as specified. Since not every program can run stand-alone, unit tests require drives and stub programs to be able to run the program under stand-alone test conditions. Unit tests are ideal during development because related modules may not exist and it is easier to isolate defects when programs are run stand-alone. The situation is completely different for year 2000. The programs are production systems and the changes are very specific. Hence, we do not recommend unit tests unless:

- The software engineering practice of the organization requires unit testing for all changes
- Unit test cases exist and are up-to-date

We recommend an alternate form of unit testing, better suited for the year 2000, that we refer to as the "peephole" test. This method tests the changes in isolation, ensuring that the modifications are compliant and did not introduce unintentional defects. Path analysis tools such as SEEC COBOL Slicer can show how control-flow can be directed to the changes to test them.

You can also achieve the same benefits of unit testing by measuring "coverage." The renovated source code can be used to log the statements that were executed during a test run. Analysis of this log shows the changes that were not covered by the test run. Path analysis tools can be used to generate test conditions to supplement the test suite with new tests to cover them.

Compliance Tests or Time-Dimensional Tests

Compliance or time dimensional tests ensure that the systems will work in the next millennium. The testing is accomplished by simulating future dates and aging existing data to generate appropriate future data. The following sections detail these steps:

Simulate Future Dates

A future date can be simulated in three ways:

1. Set the CPU clock to a future date and time. Even though this is the best way to perform time dimen-datasets or licenses to expire and, therefore, should be reserved for only the final stages of testing.
2. Create a logical partition (LPAR) and supply an alternate time for the LPAR. Creating an LPAR can be complex and time consuming. Note that it may not be worth the effort because, again, it may cause datasets or licenses to expire.
3. Use a clock simulation tool. These tools intercept system calls to dates and supply the application with alternate dates. These tools allow precise control at the module or application level.

Whichever method you choose, test to ensure the following dates operate correctly: 9/9/1999, 12/31/1999, 1/1/2000, 2/29/2000, 1/1/2001. Test for dates used as keys or indexes, date usage in sorts, search criteria and purge logic.

Data Aging

To test the systems in future dates, you need future data, but it may be difficult to create fresh data containing future dates. One method is to age existing data by a specified number of days and tools are available to help with this. While aging the data, preserve all date relationships. If the application that uses this data is sensitive to days of the week, make sure you preserve those specific date relationships.

SEEC's AccuTest Solution

SEEC AccuTest is a comprehensive testing solution that combines "white box" testing techniques with the conventional "black box," or functional, testing. Its components include: a test management tool, a capture and playback tool, a path analysis and test coverage measurement tool and a date simulation tool.

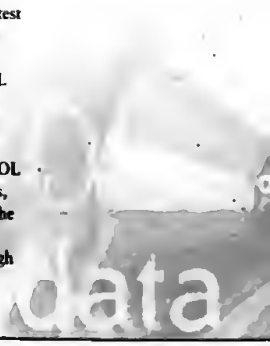
The test management tool is a groupware that allows developers, testers and managers to cooperate throughout test planning, automated test execution and defect tracking. The capture/playback tool lets the user record the test session once and repeatedly play it back. Its rich functionality permits extensive customization to make a single script test different scenarios. This tool is tightly integrated with the test management tool to store the test scripts and execution results in a single repository.

AccuTest's core component is SEEC COBOL Slicer. COBOL Slicer helps in test planning and test preparation by generating the test cases for the renovated programs. It optimizes and improves the quality of testing by minimizing the number of tests and, at the same time, maximizing coverage. SEEC COBOL Slicer lets you measure test coverage to evaluate the adequacy of testing and test data.

The test cases generated by SEEC COBOL Slicer are useful during all phases of year 2000 conversion. During assessment, they can be used to estimate the testing effort. During planning, depending on whether the renovation strategy is windowing or field expansion, an appropriate criterion can be specified to generate the test cases only for those lines that need to be changed. After renovation, COBOL Slicer can be used to generate test cases for all changes to the source code. The output of COBOL Slicer is a list of test cases, each of which describes the conditions to be met to direct control flow through a desired path.

The test coverage measurement feature generates an "instrumented" version of the renovated source code. The instrumented source is identical to original source except that it has an added feature to profile tested lines. When the instrumented sources are compiled and tested, they generate coverage information. This information is used to generate a report of coverage statistics and a list of untested statements. The untested statements are used to generate additional test cases to improve coverage.

The date simulation tool intercepts the specified application's request for system date and time and substitutes the actual date/time with the date/time specified for the application. The simulated date can be specified as an absolute date or a relative date. The simulation can be specified for a job, started task, a TSO user ID, CICS transaction or IMS/DC application. ◆



USA Group

"On-site Factory Saves Time and Money for USA Group"

Like many organizations, the USA Group—a leading national provider of financial and management services to the education community—believed that its year 2000 renovation program would be too time-consuming to handle in-house. After several service providers proposed using SEEC's Smart Change Factory solution to do the Y2K project in an off-site factory, the team at USA Group rethought their strategy. They realized that using the SEEC solution in an in-house factory would cost less while giving USA Group greater control. That judgment has been borne out, as the year 2000 project is ahead of schedule and "more than one-third under budget," according to Rick Olson, director of systems development.

"We liked that SEEC offered a mature tool-set," says Kris Brothers, USA Group's year 2000 legacy system project leader. "These tools had purposes other than year 2000 renovation, but they had been optimized for Y2K projects." Adds Olson: "SEEC has an integrated tool-set, which saved us the trouble of mixing and matching tools from different vendors." Also, SEEC's solution is one of the few that supports USA Group's IDMS and ADS/O environment.

Ahead of schedule with fewer resources

USA Group's MVS mainframe environment includes programs written in three COBOL dialects as well as Quikjob, and includes ADS/O and the database IDMS. The application inventory included 40 sub-systems with 8,000 modules comprising over four million lines of code (LOC).

In the Fall of 1997, USA Group set up an on-site Smart Change Factory staffed by six consultants from Indecon, a midwest consulting company. Indecon had worked with USA Group during their tool selection process and was familiar with SEEC's mainframe redevelopment solutions from other projects, explains Dave Ewing, project leader for USA Group's Y2K factory.

A three-person year 2000 project team coordinated activities among the factory team and internal subsystem teams, which were responsible for testing and re-integration of the renovated systems. The project management team also was responsible for source code management, which proved to be more difficult than they had anticipated. Another challenge was that USA Group's programmers had been 'pushing the envelope' of IDMS capabilities. SEEC turned the challenge into an opportunity by providing product enhancements and other technical assistance to handle USA Group's unique programming issues, and added support for DC COBOL and Quikjob in its Smart Change Factory toolset.

After the pilot phase, the assessment and renovation factory moved ahead with productivity double what USA Group had expected. This was the result both of thorough source management procedures, as well as the technical experience of the factory team. High productivity allowed them to reduce the factory team to four, instead of expanding it from six to nine, as originally planned. By the end of May, they will have 75% of their systems renovated and 57% fully tested and returned to production.

Despite using fewer resources, USA Group's project is ahead of their scheduled completion date of mid-December 1998. "We are very satisfied with the quality and productivity of the SEEC tools," Brothers says. The Smart Change Factory "has performed above our expectations," Olson adds.

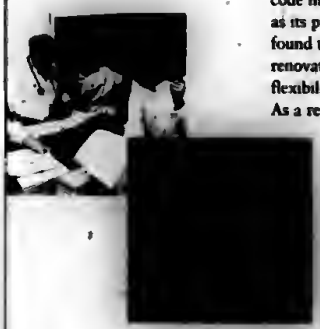
USA Group's year 2000 effort also will have some carry-over benefits. SEEC's assessment tools helped identify production errors in existing code that are being corrected by the subsystem teams, and USA Group now has compiled a comprehensive database of system elements identified by language. This will be useful in on-going maintenance, and may facilitate future language conversion efforts, Brothers says.

Anthem, Inc.

"High Productivity and Accuracy Changes Perceptions of Automatic Renovation"

The year 2000 problem is challenging IT managers to find new and better ways to handle large-scale reengineering projects. At Anthem, Inc., a large health care management and insurance company based in Indianapolis, the year 2000 project required a "change in philosophy," stated Janet Myers, Director of Anthem's Year 2000 Program. A cornerstone of this change is the use of tools that provide automated code-renovation capabilities.

In the past, Anthem relied exclusively on traditional code modification processes as its programmers had found that automated code renovation tools lacked flexibility and functionality. As a result, there was a real skepticism of automated code-renovation tools within the company's IT division. On the other hand, a manual year 2000 conversion-process would add human error, time and expense to the project. With the immovable January 1, 2000 deadline, time was of the essence.



"The automated code renovation solution we are using provides the high productivity Anthem wanted," Myers stated. "We are able to do weeks worth of programming work in days."

Besides high throughput, Anthem's renovation team had a very short learning curve. During an initial pilot, which was also used as a training period, program-mers completely renovated 260 programs at a rate of 10 programs per workstation per day. Ninety-five percent of the required program changes were made automatically and, as Anthem discovered during later testing, those changes were also highly accurate.

Between August 1997 and March 1998, a five-person team assessed and renovated eighty percent of the 30 million lines of COBOL programs associated with Anthem's business in the states of Indiana, Kentucky, and Ohio. Out of the 30 million lines of COBOL, about 10 percent of the lines of code were date-affected. The renovation team pinpointed and then tagged the code that directly needed to be changed, saving programming time. Now, 20 percent of those programs have been returned to production, and productivity has remained high throughout the renovation phase.

"One advantage of the renovation tool is that we could tailor it to our situation," stated Myers. Anthem customized the tool to meet its specific programming requirements and programmers added 10 new rules. And because the tool is a PC/Windows-based solution, the renovation process did not create new processing demands on the mainframe. "We had tried a mainframe-based [year 2000] tool, but our programmers preferred a LAN-based product. The mainframe tool also utilized a large amount of the CPU, thus increasing our costs. In addition, it also was more convenient to maintain continuity between our PC-based assessment tools and the renovation tools," Myers said.

Anthem, which expects to complete the renovation portion of its year 2000 project before the end of this year, is using both SEEC Smart Change 2000 and SEEC COBOL Analyst 2000 in its renovation efforts.

Patni Computer Systems

"PCS Demonstrating Off-shore Productivity"

With the year 2000 deadline looming rock-solid in the near distance, many organizations are turning to experienced year 2000 service providers to accelerate compliance efforts. One such provider is Patni Computer Systems (PCS), a leading global software services company with over 1,500 software professionals, with customers including General Electric, Hitachi and Baan. PCS has been using SEEC's Smart Change Factory solution together with its own SeCure2K methodology to offer reliable cost-effective year 2000 services.

PCS recently completed its first full-scale renovation project using the SEEC solution at its off-shore year 2000 conversion facilities in Pune, India. The ten-member conversion team renovated and tested 2.4 million lines of COBOL/IDMS code for a billion-dollar U.S. defense contractor. The success of this project demonstrated the reliability and productivity of off-site conversion when combining the automated output from SEEC tools with PCS's established quality-assurance procedures and world-class project-management practices.

Project Scope

Like many organizations, PCS's client chose to migrate its legacy systems to newer, year 2000 compliant ones, instead of renovating all older programs. Migration, however, will not be completed before 2000; this meant some older systems had to be renovated in spite of migration plans. Rather than divert in-house resources to these year 2000 efforts, the customer used PCS expertise to provide a quicker, more cost-effective renovation.

Before any off-site renovation took place, PCS sent two team members to the customer's site. For a month, PCS staff worked with the customer to develop project estimates, schedules, determine the conversion methodology, testing methods and form acceptance criteria. PCS staff also worked with client personnel to ensure code was downloaded correctly. This careful process ensured continuity and consistency throughout the project. With plans in place, the code-consisting of 3,565 programs totaling 2.4 million lines—was transferred to PCS's year 2000 factory. Throughout the project, an on-site coordinator (OSC) remained at the customer site to facilitate communication between the client and the remediation team in India.

Within the factory, PCS used SEEC COBOL Analyst 2000 to assess the date-impact in the programs and build an application repository. Analysis showed that less than five percent of the program code was date-affected. Then using SEEC Smart Change 2000's AccuFind feature, the 10 member remediation team identified and tagged date-items that needed to be corrected. The use of SEEC's windowing methodology reduced this to about 4/10th of 1% of the total lines of code. The programmers applied Smart Change 2000's AccuFix feature to automatically correct the affected code. Manual changes were also required to some applications, including the correction of some date-related items in already year 2000 compliant code. These were completed in one month. One such correction was when the team spent a total of 54 person-days to manually correct a single, 600,000 line application.

Due to Smart Change 2000's automatic conversion, overall productivity to find and fix the code (including manual changes) was an efficient 300,000 lines of code per man-week for impact assessment and 75,000 lines of code per man-week for renovation. Besides high productivity, SEEC's Smart Change Factory solution offered consistent programming logic and extensive documentation to assist future program maintenance. This is especially important in off-site renovation work, as future maintenance becomes the responsibility of in-house staff.

Following renovation, PCS performed unit and integration testing using multiple 64 kbps satellite links to the customer's mainframe. Group leaders developed integration test plans for only the impacted processing threads; then the factory team ran integration tests using data provided by the customer. The same programmers who converted specific programs developed unit test plans and generated test cases for those programs using SEEC COBOL Slicer. COBOL Slicer simplified test-case generation and reduced unit testing costs by pinpointing the data paths that needed to be tested. Because PCS only needed to convert some of the system modules, the customer has taken final responsibility for system testing.

SEEC's Smart Change® Family of Products for the Year 2000.

SEEC knows you've got a lot to do and a limited time to do it. You need a proven year 2000 solution that will get the job done fast and done right, no hassle. SEEC's Smart Change Factory tool suite gives you the license to powerful, accurate tools and methodology that speed along your year 2000 efforts and leave you plenty of time to test. Plus, the Smart Change Factory products support a wide range of platforms and dialects including IBM, Unisys, DEC, and HP, many COBOL and non-COBOL languages, and databases like ADABAS, DMS, IDMS, IMS, CICS, DB2 and VSAM. And because SEEC's tools are PC-based they're easy to learn and use.

SEEC gives you the right-of-way to a proven year 2000 solution, no apprehensions.

For more information on how SEEC's Smart Change Factory Solution can help you find and fix your Year 2000 dates, call (412) 893-0300.

A Y2K pioneer seeks (and deserves) recognition

Paul Gillin

It was a frigid Wednesday in February 1984, and I was stumped for a story idea. The software business was dead that time of year — not good news to a guy who wrote about software for *Computerworld*.

Then the phone rang. On the other end was a guy from Detroit who had an idea that was so offbeat, so screwy, that I thought it just might make my editors happy. It was good for a laugh, at least.

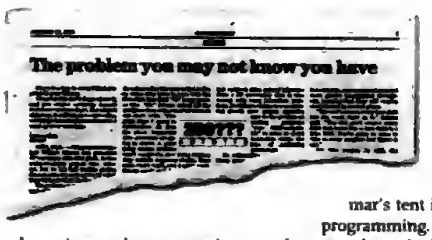
Bill Schoen had this wacky idea that a lot of computers — I mean a *lot* of them — would stop working on New Year's Day 2000. Schoen wasn't just curious about this problem, he was passionate about it. He had even formed a one-man consulting company to try to spread the gospel. But no one, he said, wanted to listen.

I listened. Heck, I was desperate. I interviewed Schoen, talked to one of his clients and wrote it up. My editors put the story on page 7 of the Feb. 13, 1984, issue. It was the first article to appear in a major publication about the year 2000 problem. (You can see a copy of the original story at *www.computerworld.com/more*.)

I spoke to Bill Schoen again the other day. Now 51, he's still in Detroit, still programming and a little amazed about how propbetic his crusade was. Though he wishes he could have had a piece of the five-figure speaking fees that top year 2000 consultants make, what Schoen *really* wants today is a little recognition.

Bill Schoen was passionate about the problem long before the world was ready to listen.

Schoen first stumbled on the year 2000 problem in 1983 while programming in the basement of a Big Three automaker. It wasn't rocket science; data processing people had known about the risk since the 1970s. It's just that no one thought their code would last that long.



Schoen thought it might, and a little analysis of his employer's code library proved to him that software had considerably more staying power than many people thought. If business had started coding for the millennium in 1983, "95% of the problems wouldn't be there today," he says wistfully.

For Schoen, the year 2000 problem became a mission. He coded up a little Cobol routine on his Commodore 64 that solved the problem. He named his company Charmar Enterprises and created the Charmar Correction, a cure for "the serious problem ignored by the entire data processing community."

He was an army of one. Booted out of the CIO's office in some of the biggest companies in America, Schoen landed only two sales for the Charmar Correction. He folded Charmar's tent in 1984 and went back to programming. "I've never been able to rise above the level of working stiff," he says.

AHEAD OF HIS TIME

Schoen's story is about missed opportunity and being too far ahead of the curve. *The New York Times* called him in 1988 to ask about the year 2000 problem, but Schoen was sick of rejection and asked the reporter not to quote him. His efforts to launch a year 2000 consultancy last year fizzled when the client's CEO died. Now he's got a Web site (*www.flash.net/~bschoen*) that tells a little of the story of the guy who had an answer longbefore anyone else was asking the question.

Visit Bill Schoen's Web site. Send him an E-mail. This guy was really on to something. □

Gillin is editor of Computerworld. *His Internet address is paul_gillin@cw.com.*

Wide world of worries

John Gantz

I work at IDC. The "I" stands for "International," and in many ways the challenges we face supporting our own increasingly global information systems are challenges for all companies.

For what company wouldn't be lured into doing business across borders by the Web? Or by the efficiency of enterprisewide applications?

It used to be easy. You either stuck to doing business in your own country, or you let your international offices handle their own information needs. The latter is the path we've always taken. But now, as we at International Data Corp. establish global product lines and write global contracts, we find ourselves trying to develop a common information backbone out of parts that don't fit together well.

We've found that getting the IT systems to work globally is the easy part; the computers, software and network protocols we use are pretty much standard worldwide. But getting information into the system, in the right shape at the right time, is a major issue; business processes vary radically by country, and development and support — the people-intensive part of the business — must be localized.

Our experience, and that of the global outsourcers and multinationals we research, teaches us that the barriers are mostly human in nature. Even something as simple as buying a global license for a piece of software can run afoul of a budgeting system that has no provision for global expense pooling. One division has to buy a license for three times as many seats as it needs, then "sell" the excess to other divisions.

But it's the various business rules for different countries that mess up global operations most. Do you plan to start taking orders over the Web? How will you ship them? Do you know each nation's tariff and customs rules and fees? Is it time for a worldwide E-mail system? The carrier that gives you the lowest price for a worldwide network may be the highest-priced carrier in a local market. Does your chargeback system handle that? Are you trying to set up a 24-hour-per-day global help desk? How many languages do your call handlers speak, and do the Americans know which countries lost to whom in the World Cup? Do you know not to use voice response systems in Australia?

OK, so those are solvable and predictable problems. More difficult is the issue of worldwide planning — where meetings are bedeviled by time zone differences, consensus is burdened by cultural differences and the U.S. business style is incompatible with the lifestyles of half the world.

Unless your global systems are in order already, you need to ponder a few things.

Hardest of all is restructuring the information itself — homegrown to fit the local systems. Merging information pools such as employee records, customer information and even phone directories becomes a monumental conversion task that, to each operating unit, looks like so much overhead at best (a diabolical home-office conspiracy at worst). Lots of sweet-talking is required to get each office to cooperate with a global data conversion plan.

I tell you all this only because, unless yours is one of the few companies that has its global systems in order already, you need to know it. The Internet will force even the smallest and most parochial businesses into global operation. The benefits of cybernetic expansion will be too good to pass up. But those benefits will come with hidden costs. Better warn the rest of the company. □

Gantz is senior vice president at IDC in Framingham, Mass. His Internet address is jgantz@idcresearch.com.

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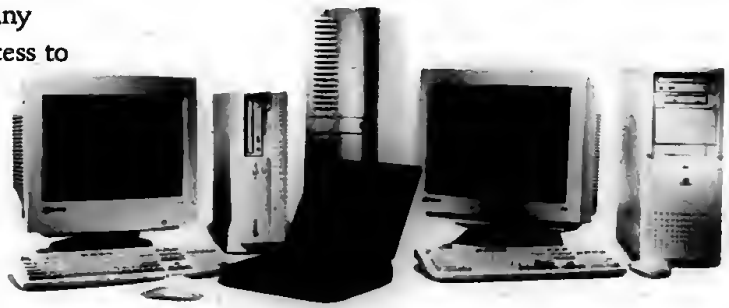

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Looking beyond today's allegations

Walid Mougayar

It's a decoy! Microsoft's present legal saga is amusing, but the company's dance with the Justice Department affects the Internet's past, not its future. With Washington distracted, Microsoft is quietly deploying another of its notorious domination strategies: Swallow up a market.

With Washington distracted, Microsoft quietly devours the virtual marketplace.

Microsoft has quietly but intently targeted online business and the virtual marketplace. New digital markets are opening, growing and, in certain cases, displacing physical markets. On the consumer side of those markets, Microsoft has done a commanding job in a short time.

Microsoft's competitors are running online businesses as their lifeblood. Music Boulevard, Travelocity, Auto-By-Tel, ETrade and others are dead serious about the Internet space they inhabit. Microsoft's competitive online endeavors (Expedia.com Travel, CarPoint, Investor, MSNBC, Music Central and so on) each have their own brand identity.

At the heart of Microsoft's online strategy is a relentless pursuit of content creation and aggregation — the starting point for those marketplaces. Couple that with the company's desire for growth and control and you have a new Microsoft growth engine. From an organizational perspective, that activity is underplayed and concealed under the Interactive Media Group, which includes CD-ROM titles, games, hardware and desktop finance products. However, all of Microsoft's 19 online ventures are visible anchor tenants in the patrimonial The Microsoft Network (MSN).

BIG BUSINESS

The strstegy is working. Last year, Expedia.com booked $100 million in sales (second to Travelocity), and the venture has generated more than $1 million in additional revenue for participating associate companies. Every month, CarPoint refers $80 million worth of cars to dealerships. The National Association of Investors offers the Microsoft Investor service to its 700,000-plus members.

Investor, CarPoint and Expedia are the fastest-growing sites in their respective categories and have won numerous Web swards. And although Yahoo sttracts 32 million visitors per month, the combination of Microsoft com, MSN, MSNBC and Hotmail tops it with 36 million. The numbers don't lie: Microsoft is the reigning digital brand. And contrary to most of its competitors, the company doesn't have to cope with the stress of raising capital, going public or disclosing repeated quarterly losses.

What lies ahead? Microsoft's online businesses are shielded from the antitrust allegations plaguing the rest of the company. Together, the online travel, music, suto, trading, spparel, news and real estate markets are expected to top $40 billioo by the end of 2000; if Microsoft captures 20% of each segment, chalk up another $8 billion in revenue. Add $300 million in expected Web advertising and the pie gets even bigger.

Interestingly, nothing about those ventures is directly related to the software products that made Microsoft what it is. Indeed, you could argue that any Fortune 500 company could have put itself in Microsoft's present online position if it hsd wanted to (or was sble to) act as decisively as Microsoft.

As Bill Gates gears up for frequent visits to Washington, will Congress wait to chastise Microsoft for its anticipated dominance of the online marketplace? Or will the company's online business elude repercussions? The jury isn't even assembled for that one. □

Mougayar is the author of Opening Digital Markets *(McGraw-Hill, 1998) and president of CyberManagement, Inc., a management consulting firm. His Internet address is walid@cyberm.com.*

A tale of two titans

David Moschella

If you're looking for some late summer reading that is both entertaining and of great business value, and if you don't mind lugging around 700 hardcover pages, I strongly recommend *Titan*, Ron Chernow's riveting new biography of John D. Rockefeller Sr.

I'm certainly not the first to point out the many interesting and timely parallels between the life of the great oil baron and Microsoft's Bill Gates. It's hard to ignore the facts that both men got in on the ground floor of s critical new industry, both managed to wipe out their direct competition and become the world's richest man and both wound up defending themselves before Congress and fighting intense antitrust pressure.

But now that I've read the book, I realize that the parallels and lessons actually run much deeper. Here are some of the things I've been thinking about:

Shifting sources of power. It's easy to forget that the initial great demand for oil was driven by kerosene, used mostly for lighting in homes. It took another 30 years for the gasoline market to take off. Similarly, the first major demand for PC software was triggered by personal productivity; the real opportunity, communications, didn't emerge for more than s decade.

Misplaced public scrutiny. As with Microsoft today, most of Rockefeller's critics focused on various tie-ins and other exclusionary business practices. Much less sttention was paid to Standard Oil's blatantly predatory tactics. The company repeatedly used highly targeted price cuts to kill off weaker rivals. Similarly, Microsoft's strategy of using freeware where competition exists — browsers, sudio/video and E-mail, for instance — and relatively high prices where it doesn't (office software) always has been much more dangerous than its forced bundling or similar tactics.

Mostly happy consumers. Both Standard Oil and Microsoft could honestly say they served their customers well by offering high-volume, low-cost products. Indeed, both companies' critics consisted mainly of government officials, the medis and their trampled competitors. Serious customer complaints were and are relatively rare.

Wrong details, right idea. Many of the most widely circulated accusations against Standard Oil turned out to be incorrect. On the other hand, the underlying public view that not all the company's gains were fairly won has held up well over time. Remember that as Microsoft defends itself against various specific media and competitor claims.

Parallels between Rockefeller and Gates are striking and instructive.

Antitrust legislation was only part of the answer. In the end, huge new discoveries of oil in Texas, Asia, the Middle East and elsewhere had as much to do with ending the Standard Oil monopoly as government intervention did.

On the other hand, the breakup of the Rockefeller empire into Exxon, Mobil, Amoco, Chevron, ARCO et al. clearly helped usher in a new competitive era.

One of the great things about the Chernow book is that it seems to strike just the right balance: "neither too sympathetic nor too sharp," in the author's words.

Indeed, the evidence suggests that laws were broken and government action was warranted. But that fact only partially diminishes the achievements of s man who built what was, at least arguably, the 20th century's greatest industry and who became, unarguably, the world's greatest philanthropist.

When the 21st century nears its end, I wonder if people will be saying pretty much the same things about William H. Gates III. □

Moschella is an author, independent consultant and weekly columnist for Computerworld. *His Internet address is dmoschella@earthlink.net.*

Trying to Manage a Costly Confusing IT Circus?

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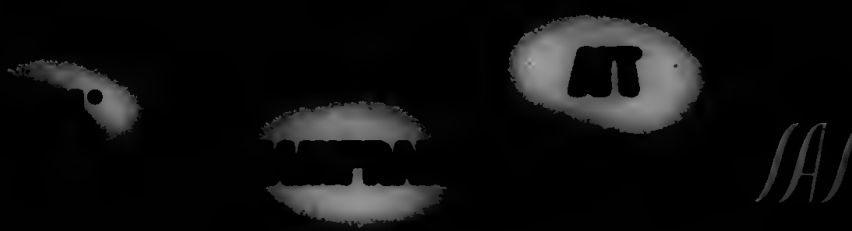

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NEC

Corporate Strategies

Case Studies • Trends • Outsourcing

Briefs

OUTSOURCING IN BANKING

Number of new bank outsourcing deals signed last year*

Fiserv	40
M & I Data Services	20
Alltel Information Services	15
Electronic Data Systems	10
Total: (11% more than 1996)	105

* With U.S.-based financial institutions with assets in excess of $500M

Source: Computer Based Solutions, Inc., Dallas

EDS's high-flying deal

British Airways Engineering has hired U.S.-based Electronic Data Systems Corp. to manage its desktop computers in a deal reportedly worth $164.15 million over 10 years, company officials said.

BA Engineering maintains and services aircraft for British Airways and 10 to 20 other airlines that fly out of London's Heathrow Airport. The shift to an outside vendor meant some BA employees were transferred from BA to EDS.

Outsource the basics

Puritus Software Services, Inc. has launched an outsourcing service that it said will let firms shift the focus of their information systems budgets and staff time to projects that go beyond software maintenance, the year 2000 problem and bug fixes. The Billerica, Mass., company said it guarantees cost savings of up to 30% and targets midsize companies that have restricted IS budgets.

Asia bookstore launch

Bookworms in Singapore now have an alternative to U.S.-based online booksellers with the entry of Bookshaw.com. A private venture spearheaded by CommerceOne Singapore, it is poised to rival Amazon.com, Inc., which has a 10% stake in the Asia-Pacific market (excluding Japan), according to Colin Miles, Bookshaw.com's general manager. He said Bookshaw.com can deliver anywhere in Asia within a few days.

Heavy on the business users

▸ *IT projects increasingly involve process decisions*

By Craig Stedman

BUSINESS MANAGERS drafted to lead their companies into the modern world of corporate applications are making sure they bring plenty of friends along to help.

At many companies, that produces project teams weighted much more toward business units than the information technology department. The reason is simple: Users may be installing software such as SAP AG's R/3, but their top to-do item is getting the business ready for the technology.

"What SAP really drives you to do is make business decisions," said Lyn McDermid, acting chief information officer at Virginia Power Co. in Richmond. The $5 billion utility, a subsidiary of Dominion Resources, Inc., went live with R/3 last month for finance, human resources and other back-office applications.

Virginia Power tapped one of its controllers to jointly lead the project with an IT manager, McDermid said. And though the 75 utility employees on the R/3 team were split equally between the two sides, many of the IT representatives were business analysts who work in her department.

Only about 20 technical workers — such as programmers and database administrators — were needed. "The software takes care of a lot of that for you," McDermid said. On the other hand, she added, the R/3 team made almost 3,000 business process decisions during a five-month period.

At Tulsa, Okla.-based Citgo Petroleum Corp., Sharon Kaiser moved from IT to a business planning job in 1991 but switched back last year to manage marketing and supply applications. On a recent rollout of Logility, Inc.'s demand planning software, Kaiser led a team of seven business

Business users, page 40

Car group's millennium czar drives supplier readiness

YEAR 2000

First, Fred Craig fought year 2000 battles at GM. Now, he's trying to help the entire auto industry and its partners in related industries win the millennium war.

Before joining the Automotive Industry Action Group (AIAG) in Troy, Mich., as year 2000 program manager in April, Craig developed a global awareness and communication plan at General Motors Corp. to ensure understanding and support of efforts to fix systems to recognize the year 2000.

Fred Craig: Confident of auto industry's year 2000 success

At the AIAG, Craig is responsible for continued industry awareness of the year 2000 problem and helping suppliers prepare for it. The organization has about 1,400 automaker and supplier members.

Automakers increasingly demand that any supplier that won't be year 2000-compliant must develop contingency plans — or possibly be replaced.

Craig discussed the AIAG's current and planned year 2000 efforts with Computerworld senior editor Bob Wallace.

CW: What's the single biggest challenge you face in your job?

CRAIG: It's definitely the sheer number of suppliers. We want to be sure we reach the entire supply chain with self-assessment surveys and that no one is left out of the effort.

CW: You've reached the majority of the automakers' top-tier suppliers with the mailings. How are things going beyond that?

CRAIG: We've launched a similar program that's targeted at 40,000 tier-two and -three supplier locations [those companies that supply parts to an automaker's top supplier]. They will receive the surveys just as the large suppliers did. With this effort, we're moving much further down the supply chain.

CW: Will the AIAG conduct any year 2000 testing?

CRAIG: No. The automakers and the suppliers will do the testing. We expect it to be done by the end of the year so that time beyond that can be spent on any hiccups and things

Millennium, page 40

UTILITIES

Deregulation puts focus on workflow

By Roberta Fusaro

THE RECENT heat wave sweeping much of the U.S. isn't the only thing lighting a fire under power utilities. Deregulation is looming. And several electric companies are changing their workflow processes to make sure they are ready to capture the business.

Florida Power & Light Co., the third-largest public utility in the country, with more than 7 million customers, is installing Version 7.0 of Universal Systems, Inc.'s TrackWorks Rapid Process Manager (RPM) to streamline business operations and reduce paper use.

The 32-bit version of RPM adds World Wide Web-based access and workflow capabilities to previous generations of the product. Companies can collect data in a central database, query it for information, route docu-

Workflow, page 40

Virginia Power's Larry Carter: Before installing an electronic workflow system, people wasted time managing paper

Doctors feeling feds' Y2K pain

By Matt Hamblen

DOCTORS AND HOSPITALS are blaming the federal Health Care Financing Administration (HCFA) for dragging its feet on year 2000 preparations — a situation that means a three-month delay in moving to higher Medicare payments.

"We have grave concerns about the agency's ability to devise a solution that is equitable and acceptable to all physicians," said Donald J. Palmisano, a trustee of the American Medical Association in Washington.

Doctors and hospitals should not have to "pay for government's mistakes" by settling for a delay in a payment update, Palmisano told the U.S. Senate Special Committee on the Year 2000 Technology Problem two weeks ago.

Because HCFA is concentrating on fixing internal systems for the year 2000, it has delayed work on a new, congressionally mandated system to make Medicare payments to health providers. The system, required by the Balanced Budget Act of 1997, was supposed to be ready Jan. 1, 2000, but the deadline has slipped to April 1, 2000.

Hospitals are concerned that there could be a general breakdown in the Medicare and Medicaid payment system.

HCFA, which administers Medicare and Medicaid for the federal government, is "making substantial progress" in getting all 98 mission-critical systems renovated by year's end, said HCFA administrator Nancy-Ann Deparle.

HCFA's year 2000 contractor, Intermetrics Corp., told the agency to "clear the decks of projects that could interfere with year 2000 work ... including congressional mandates," Deparle said. The delay in the new payment system is essential to give year 2000 contractors time to get their work done, she added.

The slipped deadline worries the 5,000 hospitals represented by the American Hospital Association (AHA), said Jennifer Jackson, an AHA spokeswoman and a vice president at the Connecticut Hospital Association.

The delay has hospitals concerned that there could be a general breakdown in the Medicare and Medicaid payment system, which provides about half the revenue hospitals need to operate. "If that much revenue were to be suddenly cut off, hospitals could not survive, and patient care could be jeopardized," Jackson said. She said vendors wouldn't be paid, leaving hospitals unable to maintain equipment or purchase food or other supplies. She said HCFA needs an alternative to the delay in the new payment system, including making payouts in advance of bills from hospitals.

Also concerned is Sen. Robert Bennett (R-Utah), chairman of the Senate Special Committee on the Year 2000 Technology Problem. Bennett said insurance and Medicare eligibility processing could fail to function, leading to delays in health care access. □

Virginia Power's Lyn McDermid: R/3 team made almost 3,000 business process decisions in five months

Business users

CONTINUED FROM PAGE 39

users and just one other IT worker.

"With software like this, you really have to know your business and all the little quirks that can come up," Kaiser said.

And now, the users who took part in the project "know more about the system than our IS people do, when it's usually the other way around," she said. One of the users is basically running the show in training other employees to run the Logility software, Kaiser added.

David Caruso, an analyst at AMR Research, Inc. in Boston, said many application project teams get by with just one or two IT representatives, who can judge whether the software will support the configuration and workflow choices made by business users.

"This is not a programming project," Caruso said. "It's more a case of deployment at the business level. And it really takes business managers to say what it is you want to wring out of the process."

Minerals Technology, Inc., a New York-based company that mines and processes minerals, assigned 23 business users and just five IT employees to work on an upcoming installation of new manufacturing and order-management applications.

"We wanted to make sure it was a business-driven project," said Keith Hanchett, a longtime business executive who became director of IT at Minerals Technology two years ago. The company bought the software "to support doing business the way we think it ought to be done, not just to better automate things," he said. □

Utilities focus on workflow

CONTINUED FROM PAGE 39

ments electronically, process them in parallel and automate customer service support. Memos and other paper-based notifications can be replaced with E-mail and pager notifications.

Debra Martinez, supervisor of integrated document management at Florida Power, said the Web-based system will give her "a big-picture view" of information moving through the organization.

Florida Power, in Juno Beach, Fla., had been using an earlier version of RPM to manage employee files in the human resources department. But that system was set up as an island unto itself, Martinez said. Now the document management system will be rolled out across eight departments, including customer service, procurement, nuclear engineering and marketing. It will let the utility serve more customers more efficiently and without having to add resources, she said.

Virginia Power Co. in Richmond is considering a similar move. It uses Chantilly, Va.-based Universal Systems' Documetrix 2000 workflow system in its accounts payable department. The company installed the technology in January 1996, when it centralized its accounting staff from 15 different plants, said Larry Carter, project manager for business systems.

"We have reached a point where we don't want to use [the system] just for ourselves. We haven't mapped out specific plans, just a general notion to expand the application to other departments in the company, probably after the first of the year," Carter said.

People in accounts payable were spending too much time managing paper, maintaining files and trying to find documents to complete a process or respond to a vendor, Carter said. Now the company uses less paper, which has resulted in overall savings for the utility, he said.

The Universal Systems product routes invoices received from vendors or internal paperwork that supports payment to vendors. It has helped reduce the time it takes to track an invoice from 10 minutes or more — sometimes up to two weeks if the invoice had already been sent to a permanent records facility — to just seconds.

Efficiency and customer service information become strategic assets in a deregulated utility environment, said Bill Keith, president of The Keith Group, Inc., a consultancy in Atlanta. And the Web and Internet are key drivers, he added. Utilities are looking at systems that move information across the enterprise, such as Universal Systems' product and workflow offerings from companies such as Documentum, Inc., FileNet, Inc. and PC Docs, Inc.

Martinez last week said she expected the RPM 7.0 installation on Florida Power's 9,000 desktops to be completed within days. A full rollout is due by January. ·

Kris Allen, president of Semper Technology, Inc., a consultancy in Fairfax, Va., said utilities can use such systems as an offensive weapon for creating branded customer services.

For example, he cited one utility that has built a database of client profiles that would include information about medical and support systems in the home. □

Millennium

CONTINUED FROM PAGE 39

that may be overlooked.

CW: What does your group offer in the way of training for year 2000?

CRAIG: We offer year 2000 assessor and project management training courses that are now being held in community colleges and, in a growing number of cases, at supplier sites.

By going to them, we can get more people trained more affordably. This helps the suppliers and it helps us. About 700 people have been through training [since mid-March]. We're planning on launching a Web-based training program, which should be operational in September.

CW: What resources do you offer AIAG members?

CRAIG: We have a tips and techniques database with lessons learned, as collected by members and consultants. We also have a plant-floor equipment knowledge database, where information is stored on experiences with devices like robots that have embedded chips.

CW: How helpful is the plant-floor database?

CRAIG: Well, everyone is expected to test components and systems themselves. You may not want to take someone else's word on a product. But I think this database helps, because it [can] mean people don't have to start from scratch.

YEAR 2000

CW: The AIAG has been working with other vertical markets on year 2000. What's the interest there?

CRAIG: We've formed committees for the health care, utilities and financial industries. We want to assess their year 2000 readiness because they provide services to the auto industry.

CW: What's your prediction for the auto industry?

CRAIG: We've still got a year and a half to go. And I'm confident we'll succeed. □

Internet Commerce

Extranets • The World Wide Web • Intranets

Briefs

CAR RESEARCH

U.S. consumers who use the Internet before buying a vehicle

Type of vehicle	
European-made	31.1%
Asian-made	27.3%
U.S.-made	15.6%

Base: Survey of 40,000 new-vehicle owning households

Source: The Polk Co., Detroit

Get a job

New York-based Net Jobs, Inc. has announced a new feature on its World Wide Web-based recruiting site (www.hotjobs.com) that lets applicants E-mail job postings to friends or colleagues directly from the site. The new feature can be accessed from the site's job search page.

Time to get ready

Lotus Development Corp., IBM and GW! Software, Inc. last week announced an application and server bundle that will let businesses deploy an all-in-one Web-based customer service system. The [illegible] will integrate [illegible] Lotus' [illegible] and IBM's [illegible] servers.

Dynamic data display

▸ *Web technology gives a 'graphic' depiction of profits, productivity*

By Sharon Machlis

IS A PICTURE worth a thousand numbers?

That's somewhat the theory behind moves by several manufacturers to display detailed data in graphs or charts by using World Wide Web technology.

ONLINE CHARTING

At Chevron Corp.'s Global Lubricants division in San Ramon, Calif., for example, executives wanted a way to keep running tabs on the profitability of various product lines and their resulting revenue.

The information was already in the company's Oracle Corp. databases, but it was being used only for sales force reporting tools, said David Reese, a software developer at Chevron. "There was no way for management to see the data day by day," he said.

Managers also wanted to monitor product shipments to various large storage areas to ensure that supplies didn't run too low and to protect against shipments beyond a terminal's capacity.

Using a relatively new class of products that can build and maintain dynamically generated charts and graphs, Reese created applications that let executives view profitability and product levels graphically. The Java-based NetCharts software package from ChartWorks, Inc.

in Silver Spring, Md., lets users see resulting graphs over the intranet using a standard

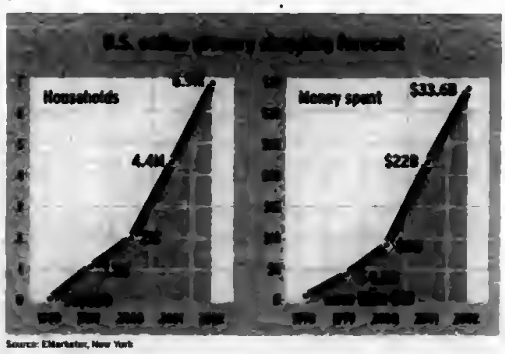
Dynamic data, page 42

Grocers watch Web growth

By Sharon Machlis

THOUGH INTERNET companies and conventional grocery delivery services moving onto the World Wide Web are seeing growing sales, most traditional supermarkets remain firmly in the physical world.

"Some of them may be waiting for others to make the mistakes first," said Jonathan Jackson, an analyst at EMarketer, a analysis firm in New York.



Source: EMarketer, New York

A few conventional retailers such as The Stop & Shop Cos. in Boston have partnered with Peapod, Inc. in Skokie, Ill., in several major markets to provide online grocery service [CW, July 27].

WAIT AND SEE

But many are waiting to see how consumer acceptance grows. Peapod, for instance, has growing revenue but still operates at a loss.

"We are watching it," said Mickey Clerc, a spokesman for Winn-Dixie Stores, Inc. in Jacksonville, Fla., which has about 1,200 stores.

EMarketer estimates that 90,000 households will buy a total of nearly $1 billion worth of groceries online this year.

Grocers, page 44

Investors favor 'portal' sites to brokerages

By Sharon Machlis

MOST CONSUMERS who manage their finances on the World Wide Web prefer Internet portals to brokerage sites, according to a study by Cyber Dialogue and Booz Allen & Hamilton, Inc., both in New York.

Overall, Internet users represent about 30% of the U.S. population and hold almost half of all mutual fund assets, said David Howe, a vice president at Booz Allen.

Among Internet users who manage their investments online, 32.5% said they most often use America Online, Inc.'s Personal Finance — five times as many as those who prefer the most popular electronic broker, Charles Schwab & Co.

RUNNERS-UP

The second most popular finance site was Intuit, Inc.'s Quicken.com at 13.5%, followed by Yahoo, Inc.'s financial and personalized offerings at 10.8%. After Schwab, at 6.1%, Fidelity Investments came in fifth at 3.1%.

More than half of the digital investors use multiple sites to retrieve stock quotes, and almost 20% use more than one brokerage site to make trades.

The study queried 1,000 Internet users in this year's second quarter. It has a margin of error of plus or minus 3.1%. □

Certification: One way to show employers your bona fide 'net skills

By Barb Cole-Gomolski

ONE OF THE BEST things about Internet-related jobs — the fact that aptitude can make up for a lack of formal training — has a downside. Anybody can call himself a webmaster.

So it isn't surprising that efforts are under way at colleges nationwide to develop a webmaster certification, or that private companies are getting in on the act, too.

For example, USWeb Learning, Inc., a start-up company in Santa Clara, Calif., recently began to offer classroom training and tests that certify students in several Internet-related disciplines. The company is headed by Carolyn Rose, a 10-year Novell, Inc. veteran who helped launch Novell's popular

Start-ups and colleges are offering webmaster certification programs

Certified NetWare Engineer program.

Certification in the Internet

Certification, page 42

Dutch secure payments with SET

By Mary Lisbeth D'Amico

DUTCH CUSTOMERS who buy anything over the Internet from golf clubs to Windows 98 are finding a new payment option on their screens this month. They can choose to pay using the Secure Electronic Transaction (SET) protocol, designed to make 'net transactions safe.

The new option is part of a trial launched July 1 by VSB International/Visa Card Services B.V., the company that administers Visa cards in the Netherlands. It is the first such effort in the Netherlands based on SET, the security protocol for Internet payment developed by Visa International, Inc. and MasterCard International, Inc.

Credit-card companies and software vendors hope such trials will help jump-start interest in electronic commerce in Europe, where concerns about security issues, among other factors, have hindered early adoption. A recent study by Jupiter Communications, Inc. projects that European online purchases of books, music, air travel and software will reach $3.3 billion in 2002, compared with $37.5 billion in the U.S.

Although SET has come under criticism for being too slow and complicated to implement, the protocol may have a better chance of acceptance in Europe than elsewhere in the world, VSB International officials said.

That's because electronic commerce is in its infancy in Europe, so users haven't grown accustomed to the protocol that is used widely in the U.S., Secure Sockets Layer (SSL), said Hans Bouman, SET project manager at VSB International. That should make it easier for them to accept the procedures for SET, he said.

Three merchants already offer customers SET transactions, according to Bouman: Shop.nl, a diversified consumer goods company; Dunnet, a vendor of hardware and software; and The Database Co., which has set up a site called Par5 where customers order golf equipment.

HOW IT WORKS

The software, made by GlobeSet, Inc. in Austin, Texas, includes an electronic wallet, which is a browser-based plug-in downloaded to a customer's PC that lets users send encrypted credit-card information. Also included is a certification authority, which generates and controls digital certificates and cryptographic keys. The payment gateway links the merchant's World Wide Web site to the financial systems responsible for authorization and payment.

A merchant server runs the application that connects a merchant's Web site to the customer's wallet and the financial payment gateway.

Other SET trials have had less smooth sailing.

Participants have complained that SET is too complicated to implement and too slow. In the U.S., especially, merchants have clung to the rival SSL protocol. IBM recently added SSL to its payment server, which originally was only SET-equipped.

SSL encrypts only users' credit-card and personal identification numbers, whereas SET also verifies the identities of the customer and the merchant via a digital certificate.

"There are five separate transactions that take place over the Internet, and that can mean waiting five times in a queue," Bouman said. □

D'Amico writes for the IDG News Service in Munich.

Snapshot

INTERNET TRAVEL INDEX

- Percentage of travel agencies linked to the Internet, 1996: 21%
- Percentage of travel agencies linked to the Internet, 1998: 50%
- Agents that increased their Internet activity in the past year: 32%
- Agencies that use Internet communication for sales and marketing: 26%
- Agencies that use the Internet to gather travel-related information: 73%
- Percentage of all online sales that will be travel-related, 2002: 35%
- Spending on travel through the Internet, 2001: $7.4B

Sources: Travel Weekly 1998 U.S. Travel Agency Survey, Leisure Travel News 1998 Path to Profitability Survey, 1998 ASTA Agency Automation Report, Datamonitor, Forrester Research, Inc., Cambridge, Mass.

Internet certification

CONTINUED FROM PAGE 41

space could make it easier for hiring managers to determine the skill level of applicants. It also provides consultants with a way to set themselves apart in the marketplace.

Bill Cullifer, executive director of the National Association of Webmasters, a trade group in Folsom, Calif., said his group has tended to support the certification programs offered by colleges because they are more affordable than those offered by private companies.

But Bernard Reyes, a technical analyst at Hyundai Motor America in Fountain Valley, Calif., said programs offered by colleges aren't always practical for somebody who has a full-time job.

"I can only break away from work for a few days at a time," said Reyes, who was part of the beta test of USWeb Learning's three-day Web site logistics class.

IMPROVED VISION

Reyes said he came away from the class with a better perspective on World Wide Web development and added that the curriculum will help companies bring teams of Web developers up to speed.

Through USWeb Learning, students can enroll in such courses as Building Web Documents with Hypertext Markup Language, Planning and Implementing a Secure Internet Presence and Performing Effective Internet Administration.

Costs vary, but the fee for the courses and the testing is about $5,000 for the four specialist certifications offered and $7,500 for the Internet architect certification.

If you already are an expert and simply want to get the certification, you can take the specialist test for $500 and the architect test for $750. □

Dynamic data displays

CONTINUED FROM PAGE 41

browser interface.

"Charts are much more effective . . . than dumping data into a table," Reese said.

The profitability application can display product sales and profit margins daily for 45 days or monthly for the past 13 months. That allows executives to see which products contribute the most to the company's bottom line.

Reese said it would have cost $50,000 or $60,000 to develop such an application in-house. NetCharts cost $1,200.

SAVING TIME, MONEY

Consultant Nitin Uchil at Mindware, Inc. in Canton, Mich., developed an intranet charting application for Ford Motor Co., also using ChartWorks. The application lets engineers graphically display data from wind-tunnel and other vehicle simulation tests. It used to take four to five hours for an engineer earning $80 per hour or more to analyze such data in a spreadsheet. Now, the engineers can call up graphical representations of the tests via the company's internal network in about five seconds.

"It's a hell of a lot of time [saved]," Uchil said. "I guess it's a lot of money."

"There are certain types of applications where that makes a great deal of sense," said Evan Quinn, an analyst at International Data Corp. in Framingham, Mass. "A lot of companies are going to find [it] appealing."

Although transaction-oriented sites probably don't need such graphs, those applications could be useful for a variety of industries seeking to pull out information from corporate databases to help with management decisions, Quinn said.

But he cautioned that vendors such as ChartWorks should be sure their products will work with the next generation of Web content management software, so such Internet graphing applications will fit with tools that oversee all intranet content. "They don't want to end up being an island among the webmasters," he said.

Other companies that make Java-based chart development tools include KL Group in Toronto and Rogue Wave Software, Inc. in Boulder, Colo. (see chart). □

SOME WEB-BASED CHARTING PRODUCTS

Company: ChartWorks, Inc. (www.chartworksinc.com)
Location: Silver Spring, Md.
Product: ChartWorks system
Description: Java-based software that builds, shares and maintains dynamically generated charts

Company: KL Group (www.klg.com)
Location: Toronto
Product: JClass Chart
Description: JavaBean for using charts in applications and applets. Includes flexible data source and interactive options

Company: Rogue Wave Software, Inc. (www.roguewave.com)
Location: Boulder, Colo.
Product: Chart.J
Description: Incorporates customizable, dynamic charts in Java applications

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Grocers watch Web growth

CONTINUED FROM PAGE 41

That is a tiny portion of the $401.7 billion overall grocery sales posted last year, according to the Food Marketing Institute in Washington. But EMarketer forecasts that 6.9 million households will purchase $33.6 billion worth of groceries via the Internet by 2002.

The Great Atlantic & Pacific Tea Co., which operates A&P and Waldbaum's supermarkets, plans to offer online ordering of prepared foods from its deli counters.

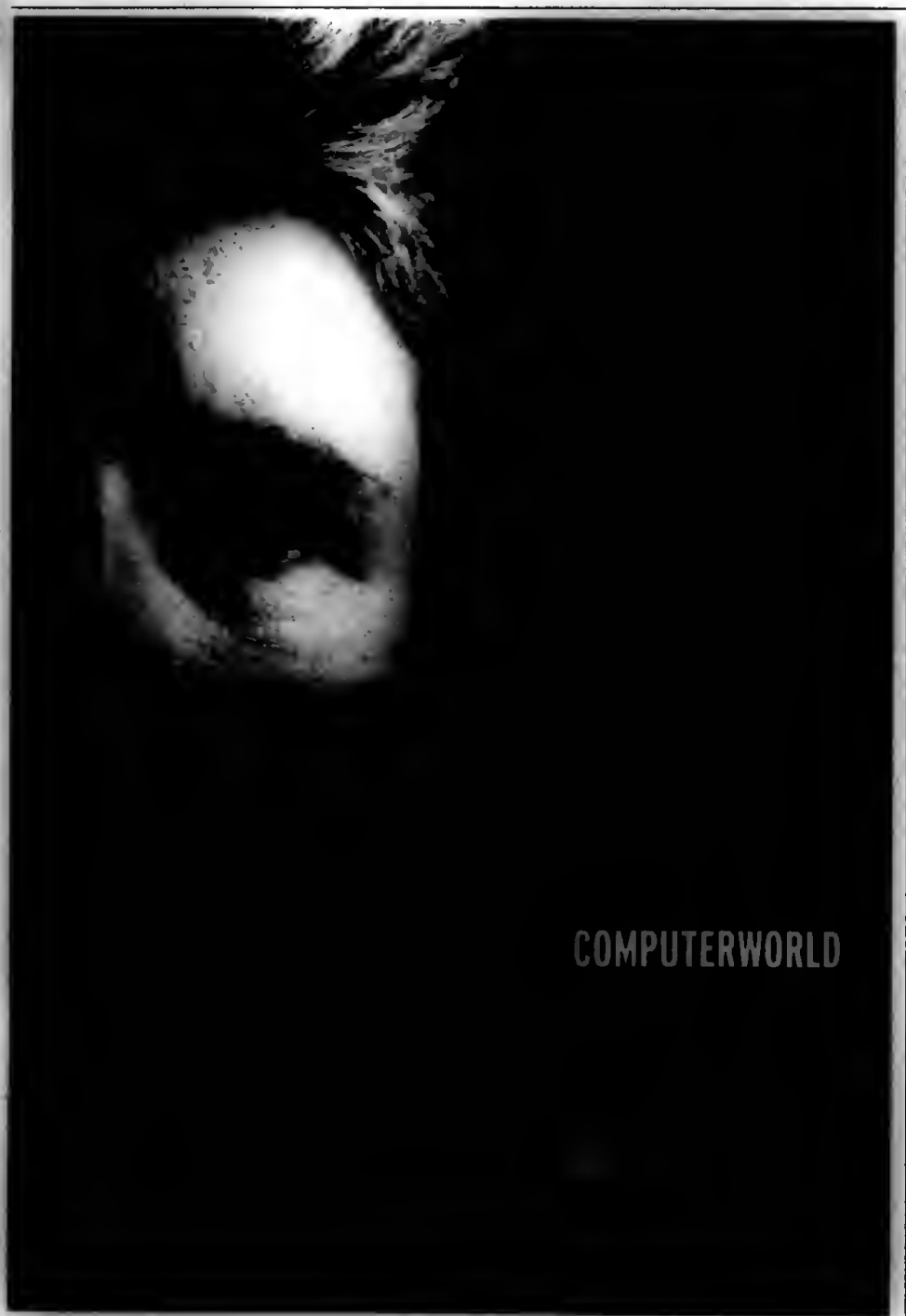
However, consumers still will have to go to the store in order to pick up their goods.

The Montvale, N.J.-based company is partnering with San Francisco-based Cybermeals, Inc. and expects to launch the service next month.

"It's a way for us to get [customers] into our stores," said A&P spokesman Andrew Carrano.

With groceries being an intensely competitive, low-margin business, "you have to be really careful where you're adding overhead," said Nicole Vanderbilt, an analyst at Jupiter Communications, Inc. in New York.

And delivering perishables is a much more complex problem than shipping hard goods. But some Internet food services, such as NetGrocer, Inc., don't handle perishables — for now. □



NEW PRODUCTS

TRIBAL VOICE has announced PowWow 3.6, software for Internet community creation and hosting.

According to the Scotts Valley, Calif., company, the client/server software incorporates instant messaging, integrated voice chat, buddy lists, real-time point-to-point communications, collaborative whiteboards, guided World Wide Web tours and file sharing.

Users need a PC and an Internet connection. Community managers establish membership criteria — such as passwords or authorized IP addresses — and control assignment of moderation privileges.

The client software is free, but creation and hosting for each group of 10 users costs $49.95 per year.

Tribal Voice
(408) 461-3100
www.tribal.com

ADAPTIVE MEDIA, INC. has announced Envision3D, Web-based software for visual collaboration across a geographically dispersed design chain.

According to the Sunnyvale, Calif., company, the software uses patented three-dimensional streaming technology to transmit models as big as 800M bytes and 960,000 objects to desktop PCs with just 64M bytes of RAM.

It was designed for delivery over existing networks. Pricing combines both concurrent and per-seat licensing, with an initial installation price of $24,995.

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Briefs

ATM FORECAST

Worldwide market for Asynchronous Transfer Mode access equipment*

1997	$208M
2001	$1.2B

* Multiplexers that link sites to ATM wide-area network services

Source: Cynthia Hardy, Probe Research, Inc.

Secure Web access

[illegible] Co. in Palo Alto, Calif., and Novell, Inc. in Provo, Utah, have inked a pact to bundle the HP [illegible] UC 3 system with Novell's BorderManager to [illegible] to provide [illegible] access, according [illegible] and to deploy a security [illegible] for their Internet and [illegible] users.

The bundle also [illegible] Internet-messaging group is [illegible] its own Internet messaging technology that, unlike the Novell, Redmond, Wash.-supplier product, [illegible] messages into secure envelopes to be opened [illegible] Messenger is opened to [illegible] by you're sent.

[illegible]

NetWare tackles Internet security

▸ NDS will handle encrypted services

By Laura DiDio

NOVELL, INC. last week said it will incorporate embedded Internet security capabilities in NetWare 5.0 that will let administrators manage all encrypted information and services via Novell Directory Services (NDS).

NetWare 5.0 is slated to ship next month.

NetWare 5.0's forthcoming Public Key Infrastructure Services (PKIS) will comply with the industry-standard Lightweight Directory Access Protocol (LDAP). That's important because the deployment of LDAP applications that use PKIS will increase dramatically over the next few years, said Phillip Carden, a consultant at The Renaissance Worldwide, Inc. in Hoboken, N.J.

PKIS is integrated with Secure Sockets Layer Version 3 encryption technology to enable businesses to issue and manage secure, verified messages, also known as "certificates," said Michael Simpson, Novell's director of marketing. The PKIS facility will obviate the need for network administrators to manage a separate database of digital certificates, he added.

VITAL COMMUNICATIONS

Jag Jagtiani, vice president of information technology at Sotheby's, Inc. in New York, said the NetWare 5.0 PKIS provides functionality the international auction house needs to support secure communications.

Sotheby's plans an electronic-commerce application within the next two years to sell art and other collectibles in 41 countries. "The NetWare 5.0 PKIS will make life easier for my end users by giving them single sign-on capabilities," Jagtiani said.

He said he expects the product to cut his system management costs "because we can

NetWare, page 46

Q&A

New 3Com exec to bulk up systems

Looking to add to its senior management to keep pace with company growth, 3Com Corp. recently named senior Digital Equipment Corp. executive Bruce Claflin its first president and chief operating officer. Claflin will report to 3Com Chairman and CEO Eric Benhamou starting Aug. 10. The 25-year industry veteran will oversee the worldwide operations of 3Com's $5.4 billion networking business. All four business units will report to him. Claflin and Benhamou discussed the move with Computerworld *senior editor Bob Wallace.*

CW: Why has it taken 3Com until now to create the post of president?

3Com, page 46

Starting the fiscal year with "refreshed product portfolio"

Tool aids network troubleshooting

By Patrick Dryden

OPTIMAL NETWORKS CORP. hopes the next version of its transaction analysis tool will ease the struggle to make client/server applications perform acceptably.

This week, the Mountain View, Calif.-based vendor will introduce Version 2.0 of its popular Application Expert, which breaks down one set of exchanges into client, network and server activity. That knowledge can help troubleshooters reveal the cause of slowdowns, help developers understand performance issues and help capacity planners determine what to upgrade.

Such performance analysis tools are in high demand because so many businesses have adopted packaged client/server applications, for example, or have tried to build extranet applications that reach across networks with unpredictable characteristics, said Joseph J. Baylock, an analyst at Gartner Group, Inc. in Stamford, Conn.

STILL A PROBLEM

"There's definitely still a problem rolling out client/server applications," Baylock said, so savvy integrators and information systems groups try to gauge performance quality before deployment.

Enhancements in the new version, which is due out later this month, answer needs voiced by some of the 150 users

Tools, page 46

Snapshot

What would you estimate it costs your organization each time an intruder breaks in to your computer systems?

$1 to $100,000	21%
$100,000 to $200,000	9%
$200,000 to $500,000	21%
$500,000 to $1M	16%
$1M to $2M	7%
$2M to $5M	10%
$5M to $10M	2%
More than $10M	3%
Unknown	11%

Base: 1998 survey of 320 Fortune 1,000 companies

Source: Ehrman Research, Annapolis, Md.

The Enterprise Network

LANs • WANs • Network Management

Briefs

ATM FORECAST

Worldwide market for Asynchronous Transfer Mode access equipment*

1997	$205M
2001	$1.28B

* Multiplexers that link sites to ATM wide-area network services

Source: Dell'Oro Group, Portola Valley, Calif.

Secure Web access

Hewlett-Packard Co. in Palo Alto, Calif., and Novell, Inc. in Provo, Utah, have inked a pact to bundle the HP NetServer LC 3 system with Novell's BorderManager to enable customers to prevent hackers from accessing corporate data and to define a security policy for their internal network users.

The bundle also provides advanced proxy caching technology that speeds user access to data and creates a virtual private network (VPN).

Instant messaging

Microsoft Corp. is joining the instant-messaging party. It will beta-test its own instant messaging technology that, much like America Online, Inc.'s popular Instant Messenger, lets users exchange messages in real time. MSN Messenger is expected to ship by year's end.

Mobile VPN

Axent Technologies, Inc. in Rockville, Md., has released RaptorMobile 5.0, a mobile VPN client software package for Windows 98.

The package creates a VPN between a remote user's PC and Axent's RaptorFirewall to provide businesses with secure Internet data transmissions. RaptorMobile 5.0 costs $99 per client.

Management console

Tivoli Systems, Inc. has announced the availability of Tivoli NetView for OS/390 Release 1.2. The latest release allows customers to centrally manage a corporate network from a mainframe with a browser- or Java-based management console.

NetWare tackles Internet security

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Source: Warroom Research, Annapolis, Md.

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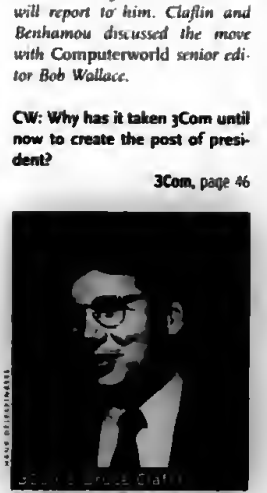


Starting the fiscal year with "refreshed product portfolio"

NetWare tackles 'net security

CONTINUED FROM PAGE 45

administer all the security and encryption facilities and store passwords in NDS."

KEEP IT IN-HOUSE

Users said the PKIS facility also gives a business the option of managing its own certificates in-house without employing the services of a third-party certificate authority vendor.

Those vendors include VeriSign, Inc. in Mountain View, Calif.; Network Associates, Inc. subsidiary Pretty Good Privacy in Santa Clara, Calif.; and RSA Data Security, Inc. in Redwood City, Calif.

Roger Clark, network manager at the National Telecommunications and Information Administration in Washington, said NetWare 5.0's system of issuing certificates is crucial because it will help his end users traveling internationally to check and transmit E-mail messages.

"[PKIS] lets us keep everything in-house which gives us . . . a warm, fuzzy feeling." – Roger Clark, National Telecommunications and Information Administration

The agency, which is part of the U.S. Department of Commerce, has a virtual private network with international Internet service providers for just that purpose.

Clark said that although all of the third-party certificate authority vendors' products work well, he prefers NetWare 5.0's PKIS.

"It lets us keep everything in-house, which gives us an added layer of security and a warm, fuzzy feeling. I don't have the worry that an outside vendor holds a piece of my encryption system," Clark said.

Carden said third-party certificate servers are priced on a per-client basis and the cost can range from $800 for a small network to as much as $50,000 for a network with thousands of nodes. Novell's PKIS facility, because it integrates the encryption technology with the network directory, potentially answers "one of the greatest challenges" facing users, Carden said.

QUICK APPROVAL

Len Steinbach, director of information services at the Solomon R. Guggenheim Museum in New York, said his multinational firm could make good use of the fact that Novell's PKIS is already certified by the Commerce Department. That means, Steinbach said, that the museum organization needs only one-time government approval to get its encryption technology for secure messaging reviewed by the government; Novell's PKIS is already approved.

"Overall, it will make our network more secure and simplify the overall management of security," he said. □

CyberMedia buy aims to enhance help desk utilities

By Galen Gruman

SEEKING TO EXPAND into the consumer market while also integrating electronic-commerce tools into its traditional enterprise offerings, Network Associates, Inc. in Santa Clara, Calif., last week bought CyberMedia, Inc. in Santa Monica, Calif., for $130 million.

Network Associates plans to add several online-updating and self-healing technologies from CyberMedia's line of desktop utilities to its Net Tools line of enterprise help desk products. The goal is to put CyberMedia's repair and updater engines into the help desk software, so information systems departments can more easily repair and upgrade networked PCs.

The company said CyberMedia's products that can be updated via the World Wide Web also will be important to companies seeking fast upgrades of end-user applications. Network Associates plans to integrate that technology across its line as well, said Kanwal Rekhi, CyberMedia CEO. Rekhi told *Computerworld* he would "retire" rather than move to Network Associates, and focus on investing and other business projects instead of running a company — at least for a while.

Network Associates will move CyberMedia's consumer-oriented tools — including the OilChange online software updater utility, Guard Dog PC firewall software, FirstAid 98 systems diagnosis and repair utility and UnInstaller program-removal utility — into its McAfee Software Division, which has a line of antivirus software.

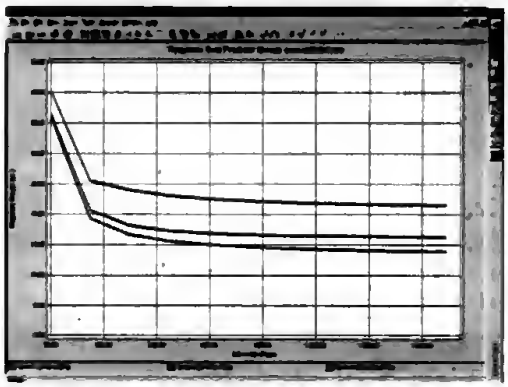
"This lets us compete more effectively against Norton [Utilities]," an offering from major rival Symantec Corp., said Pete Stewart, the division's vice president. □

NEW PRODUCT

CABLETRON SYSTEMS, INC. has announced the SmartSwitch 2E253-49R, a stand-alone Ethernet workgroup switch.

The Rochester, N.H., company said the 2E253-49R offers 48 switched 10Base-T Ethernet ports, built-in redundant power supplies and optional high-speed backbone connectivity. It also features remote monitoring and full duplex operation on every port. The 2E253-49R costs $5,995.

Cabletron Systems
(603) 332-9400
www.cabletron.com



Optimal Networks says better displays and thread analysis in Application Expert Version 2.0, due this month, will reveal causes for performance problems

Tools aid troubleshooting

CONTINUED FROM PAGE 45

who have adopted Application Expert since its release a year ago. These include: clearer explanations through charts, reports and split-screen displays; better analysis of wide-area network and Internet traffic; and deeper understanding of application threads, frames and transaction windows.

CLARIFICATION

"This version should clear up a lot of areas where we had to hop back to a protocol analyzer," said Bryan Bates, a senior analyst at SupportNet Consulting, Inc. in Calgary, Alberta.

Bates said examining application threads that way is very difficult.

He said he is eager to be able to track how long files stay open — and to show how requests overlap and affect each other — with the new version. He said Application Expert has reduced performance analysis from days spent scrutinizing protocol traces, to minutes spent generating charts and transaction profiles.

"Applications frequently work fine in the lab but perform miserably across a real network" because development LANs are so much faster than WANs and dial-up connections, Bates said. This tool is essential for helping developers comprehend network characteristics, he said.

Application Expert 2.0 is expected to ship Aug. 24. It will cost $15,000. □

3Com

CONTINUED FROM PAGE 45

BENHAMOU: We doubled the size of the company without expanding the size of the management team. We need to start differentiating a little more clearly — the people who have primary responsibility for day-to-day operations from those who really have to spend time on strategy. This is largely how Bruce Claflin and I will complement each other.

CW: Why pick someone with a PC OEM background?

BENHAMOU: Bruce is experienced in a large company environment like IBM and Digital. . . . He understands how to run a 13,000-person organization. You're not going to find people that have 20 years of experience in the networking industry that have run $20 billion organizations.

CW: How do you move 3Com beyond adapter cards and modems?

CLAFLIN: It is already much more than that, and while those are both important revenue streams to the company, there are also very large revenue streams coming from hub, switches, routers and other technologies across multiple customer sets. The last quarter that we reported, we had an almost perfect 50/50 split between what we call client access products and systems products — hubs, switches, routers and remote access concentrators.

CW: But how will you get 3Com into the core of networks where it has been weakest historically?

BENHAMOU: Well, we've actually gained market share in the systems business last year . . . [and] this year we're starting the fiscal year with a completely refreshed new product portfolio.

I'm confident that the next time I speak to you, the systems portion of our business will have grown faster than the client access.

CW: What will help you the most at 3Com from your background at IBM and Digital?

CLAFLIN: Probably the most directly relevant is the PC experience I've had. The lessons you learn there of rapid development time, fast time to market, low cost, channels — all of these attributes are transferable to a significant portion of the 3Com portfolio. □

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Software

Databases • Development • Operating Systems

Briefs

Health care on Activ!

Microsoft Corp. and Westboro, Mass.-based Data General Corp. last week announced plans to establish a network of competency centers that will foster the development of health care applications based on ActiveX. The first center, to open next month at Data General's facilities, will allow software developers to build and test ActiveX-compliant health care applications running on Data General servers.

SmartOS gets smarter

SmartOS Corp. in Palo Alto, Calif., last week released an upgrade of its application integration software that adds new status and error-monitoring features as well as support for Microsoft's SQL Server database. Pricing for Version 4.0 starts at $47,500. It is aimed at users who need periodic data updates instead of real-time application links.

SAP targets oil/gas

SAP AG last week detailed plans to add a pair of tools to its R/3-based application package for the oil and gas industries. But users will still have to wait until late next year to get the new components, SAP said.

The German company is developing trading and scheduling software for monitoring oil or gas supplies and routing shipments, as well as a retailing module tailored to gas stations.

GET AT IT

Best-selling data access tools, ranked by 1997 worldwide market share

Spreadsheets	33.4%
Spatial data management software	15.3%
Query/reporting tools	13.1%
Desktop databases	10.1%
Multidimensional analysis tools	8.1%
Others	20%
Total sales:	**$6.34B**

Source: International Data Corp., Framingham, Mass.

Harvard retools with Java

▸ *Registrar replaces 20-year-old Unix system*

By Carol Sliwa
CAMBRIDGE, MASS.

JAVA IS helping to liberate reams of student, course and other nonfinancial data at Harvard University. The information has been tucked away for 20 years in a cumbersome Unix-based file system in the registrar's office.

JAVA APPLICATIONS

No longer will university staffers have to resort to the cryptic commands of a Unix text editor to get a green screen to display a student's record or call in a programmer to generate a report about enrollment trends because none of that information had been stored in relational databases.

Instead, they will be able to access information through a more user-friendly Java application that can be accessed through their World Wide Web browsers.

"Our goal is to put in place the foundation for the next 20 years," said Arlene Becella, registrar for Harvard's Faculty of Arts and Sciences. "The current system has served us well for the last 20 years."

The college isn't concerned about doing things faster with fewer staff, Becella said. Getting rid of the old Unix set-up in favor of an open, standards-based, object-oriented system will open the door for students and faculty outside her office to gain easier access to information.

"I have to open my drawer and look through manuals to figure out the simplest things," Becella said, commenting on the Unix system. "It also takes a lot of time to manage the system. And it is a closed system, so it's hard to distribute [data] to other academic departments

Harvard, page 50

Harvard students and faculty will get easier access to data such as student records with open, standards-based system

REVIEW▸ *Visual C++*

Big upgrade closes the tools gap

By Howard Millman

MICROSOFT CORP.'s Visual C++ 6.0, which, based on a beta version, looks to be a significant upgrade of Visual C++ 5.0, adds several features that will persuade Version 5.0 users to upgrade. The improvements may not entice users away from the competing high-productivity, cross-platform C++ Builder 3.0 offered by Inprise Corp., however.

Some of the new Visual C++ features will accelerate application development. For example, the IntelliSense coding accelerator, which Microsoft is adding to all the development programs in its Visual Studio 6.0 suite, offers to complete code statements as you type them. IntelliSense also helps validate code syntax, member validity,

Visual C++, page 50

Users and analysts eagerly await Microsoft's increased efforts at enterprise customer service. Some of the issues they hope will be cleared up include:

- **Service packs that come with their own set of bugs**
- **Prolonged waits on customer support lines**
- **Not enough support personnel to handle new releases, such as with Windows 95**
- **Internal mind-set of veering away from full service**

Microsoft: Help on way. Users: Finally!

By Sharon Gaudin

OVERWHELMED SUPPORT call centers that leave frustrated users on hold. Service packs that come with their own contingent of bugs, forcing users to find antidotes for the cure they have been given.

That's what users say about Microsoft Corp.'s customer service efforts, which — while improving — are still not where they would like or need them to be.

So users said it was welcome news a week and a half ago when Microsoft said it was building up its service for the corporate enterprise customer. That effort will include pumping in an additional $200 million for technical support, creating a new business division by merging the enterprise and service units and adding more support personnel before the release of Windows NT 5.0.

This new customer support

Microsoft, page 50

Informix tools go graphical

By David Orenstein

WELCOME TO the age of graphical interfaces. Nearly 15 years after the Macintosh introduced the concept and about eight years after Microsoft adopted the graphical approach, Informix has made its character-based, fourth-generation-language (4GL) database programming tool adopt a graphical user interface.

Informix based its new Dynamic 4GL on Compiler from 4J's Development Tools in Sevres, France. Dynamic 4GL converts 4GL applications to graphical ones by recompiling existing code, giving legacy applications a modern look and feel on Windows and X Window System thin clients. A World Wide Web-client version is due out by year's end.

"Informix was responding to the installed base's demand,"

Informix, page 51

Harvard retools with Java

CONTINUED FROM PAGE 49

that need the information to do their work."

Because it could not find any software packages that would meet its needs, Harvard is using a 13-person team from Cambridge-based Nevo Technologies, Inc., assisted by seven university staffers, to do the work. Becella declined to comment on the cost of the project.

The Nevo/Harvard team spent six months analyzing the business needs and settled on a three-tier Common Object Request Broker Architecture (CORBA) to give Harvard the flexibility to adapt for future needs and extend the system to a much broader audience.

"Once people are exposed to the potential, they catch on real fast. It's Harvard," said Nevo's Ann Birk, manager of the Harvard project.

ONE STEP AT A TIME

The three-tier, object-oriented approach lets them keep the Unix-based system running while they do a phased conversion to the Java/CORBA-based system.

The application logic is concentrated in business objects in the middle tier, and the objects can be programmed with rules calling for any updates or changes in the data to be relayed to both the Unix file system and the newly installed Oracle8 database.

The first phase to go live with the new Oracle master database was the course and catalog management piece.

Other modules that will follow include: student demographics, academics, classroom logistics, examinations and workflow/academic calendar.

"When the Unix system is retired between one and two years from now, nothing will change," said Jonathan Clay, Nevo's chief technology officer.

The registrar's office already is letting other departments review courses online through Harvard's intranet. Plans call for other departments and students to be able to do more — including register for courses online and request transcripts — in the future.

With the new system, internal staffers will be able to access the application over Harvard's intranet through Version 4.0 browsers from Netscape Communications Corp. and Microsoft Corp. But Harvard hasn't decided whether the Internet-based client will be written in Java or Hypertext Markup Language.

Like many developers, the Harvard/Nevo group has found that Java's "write once, run anywhere" claim doesn't always live up to its billing.

"It's not 100% perfect," Clay said. "There are definitely glitches between the different browsers and platforms."

But the approach is considered far better "compared to the platform dependence" of fat clients in a client/server model, Birk said.

Harvard's Becella expects the the core system to be in place by next June. Internet-based applications for students and faculty will follow. □

Review: Visual C++

CONTINUED FROM PAGE 49

parameter information and type information.

Version 6.0 now provides long-overdue support for code reuse in any of the Visual Studio 6.0 tools, which include Visual J++, Visual C++ and Visual Basic.

Several new and enhanced features do a competent job of supporting enterprise application development. They are comparable to competing products — no more, no less.

For example, a fully integrated visual modeler helps build component-based multitiered application models. As an added bonus, the modeler can reverse-engineer Visual Basic projects to help unravel existing, inadequately annotated applications.

PRODUCT REVIEW

► *Visual C++ (beta)*

MICROSOFT CORP.
Redmond, Wash.
(800) 426-9400
www.microsoft.com/visualc

OVERALL GRADE B+

Price: Not available

Platforms: Windows 95/98/NT

Ship date: Visual C++ 6.0 will be available next month as a stand-alone product or as part of Visual Studio 6.0.

Pros: Improved code reuse, debugging and code completion technology reduces development time; enhanced Internet/intranet support.

Cons: Lacks direct CORBA support, offers limited cross-platform Java support.

.NET SUPPORT

Visual C++ 6.0's Microsoft Foundation Classes now include Internet Explorer 4.0 common controls, which you can drag and drop from the Controls palette in the Resource Editor.

An enhanced Active Template Library supports creating server-side ActiveX or other components.

The package's Visual Component Manager lets development teams working on large applications add descriptive information about each component's properties and methods. In addition, the Visual Component Manager simplifies the use and sharing of ActiveX controls, Compooent Object Model/Distributed Component Object Model technology and source code.

SAVING TIME

Other smart new time-savers include Dynamic ClassView, which instaotly synchronizes the code and the development environment when developers add a class or method. In addition, a welcome debugger feature, Edit and Continue, lets you correct the source code and continue debugging without having to stop, rebuild and restart the debugger (as was necessary in Version 5). During debugging, you can access a list that shows which Dynamic Link Libraries are executing, to help you isolate bugs.

New capabilities for thread-safe shutdown and configurable time-out before exit make compiled code more stable.

Other enterprise-oriented features let you access legacy programs running uoder IBM's Systems Network Architecture, CICS and AS/400 systems.

Finally, new and enhanced Wizards and OLE DB templates can help automate connectivity to back-end data, thereby easing a new application's integration with Microsoft's middle-tier Transaction Server and Cluster Server.

CATCHING UP

With this release, Microsoft appears to close the gap between its Visual C++ and Inprise's C++ Builder 3.0 (CW, May 11).

If Windows-centric applications make up the majority of your production, Version 6.0 is a worthwhile upgrade. However, if you're looking beyond the Windows platform, consider C++ Builder, which produces portable ANSI-compliant and Common Object Request Broker Architecture (CORBA)-compliant code and doesn't skew its Java support to Microsoft's Windows implementation. Visual C++ 6.0 will support CORBA, but only with third-party add-ons.

In addition, developers who want direct application programming interface access, or who prefer to write low-level code, such as their own device drivers for nonstandard operating systems, can use C++ Builder's TurboAssembler to write and debug assembler modules. □

Millman operates the Data System Service Group LLC, integrators located in Croton, N.Y. He can be reached at hmillman@ibm.net.

Microsoft: Help on the way

CONTINUED FROM PAGE 49

push isn't just about NT, but NT is in the spotlight when it comes to Microsoft's plans to extend its desktop hegemony back through the server to the database.

And Microsoft executives said improving support and keeping users happy with their software is a big step in building up that enterprise reign. They are hoping that taking care of bugs onsite, having enough operators taking support calls and fostering field-test teams in major companies will get them more companywide work.

"Microsoft should make significant changes to its service scenario for enterprise customers," said Nada Harris, deputy assistant secretary for the U.S. Department of Veterans Affairs in Washington, and one of the 30 members of Microsoft's Global Executive Round Table, a group of corporate executives who offer Microsoft feedback and guidance. "Although the philosophy is maturing, Microsoft needs to act by plowing back more of its resources into delivering on that promise at the field level."

MORE HELP NEEDED

Harris, like many other enterprise-level customers, said she plans to eventually migrate to Windows NT 5.0 when it is shipped, probably sometime next year. But she hopes that Microsoft has brought in customer service reinforcements by then to deal with what many expect to be a deluge of assistance requests.

Randall Kennedy, a senior analyst at Giga Information Group in Santa Clara, Calif., said that with NT 5.0 reportedly having more than 40 million lines of code, there are bound to be bugs. Microsoft needs to be prepared to handle them. "They need to put into place a very aggressive program," he said. "Users are more concerned that Microsoft be there to fix those breaks than to expect them to not have bugs at all."

Kevin Johnson, vice president of product support services at Microsoft, said beefing up support personnel and services before the release of NT 5.0 is one of his major objectives.

But Kennedy said users have been burned over the years and will only believe such promises when they see them.

"Leaving customers to address these problems on their own, Microsoft has dug its own grave with some of these accounts," he said. "Their service pack program has a bad reputation as being a form of bad support. They've left customers feeling like they can't trust the next code build from Microsoft."

Patrick Ryan, a software engineer at Hobart Corp., a Troy, Ohio-based manufacturing company that builds scales for grocery stores, said he would be happier if he could simply get someone on the telephone when he needs help.

"Given the history of their support, we avoid their customer support lines because you can never get in and you sit on the phone for a half hour to an hour, if you're lucky," Ryan said. "Their existing service is not up to par for Windows 95, let alone for corporate enterprise users." □

Informix tools go graphical

CONTINUED FROM PAGE 49

said Fred Hubbard, president of the International Informix Users Group and a vice president at Challenger Systems, Inc., a consulting firm in San Jose, Calif. Hubbard said Informix has been filling in holes in its product line to satisfy users who have hung on during its recent lean times.

The company endured heavy financial losses in 1996 and 1997.

The timing of Informix's recent steps to retain users, including the release of Dynamic 4GL, suits some users, such as Raley's, Inc., well, said Jim Messa, manager of store systems at the nearly $2 billion supermarket chain based in West Sacramento, Calif.

The company is moving each store's bookkeeping, labor management and other back-office systems to a Windows NT-based intranet and will use Dynamic 4GL to update the systems' interface, Messa said.

DEMO ATTRACTION

A demonstration of Dynamic 4GL at Informix's user conference in Seattle two weeks ago intrigued Yagnesh M. Mehta, project leader in the information technology group at Gambro Healthcare, Inc.'s patient services division in Nashville.

The company will consider using Dynamic 4GL to convert some of the systems in its 400 dialysis clinics across the country, Mehta said.

But in an era in which PCs are almost all graphical and Internet browsers have become a preferred interface for many users, some developers have had little choice but to stray from the 4GL fold.

"They're incredibly late with a GUI," said Mitch Kramer, an analyst at Patricia Seybold Group in Boston.

Years ago, Informix launched New Era, an ambitious visual and object-oriented development environment that it could no longer support when its financial difficulties mounted in the mid-1990s.

Meanwhile, some Informix database customers who needed graphical or Web-based applications turned to other companies' products.

For example, a year ago, ski maker K2 Corp. in Vashon, Wash., bought an order processing application from Endura Software Corp., said database administrator Erik Jellum.

Sears, Roebuck and Co. also is not using Dynamic 4GL to put a graphical face on the Informix system it uses at its call center in Austin, Texas, said Tom Gentry, director of call center technology.

Instead, the end users at the Sears call center, which takes more than 60 million calls per year, will see a browser front end developed by Pegasystems, Inc. "The browser is key for us," Gentry said. □

NEW PRODUCT

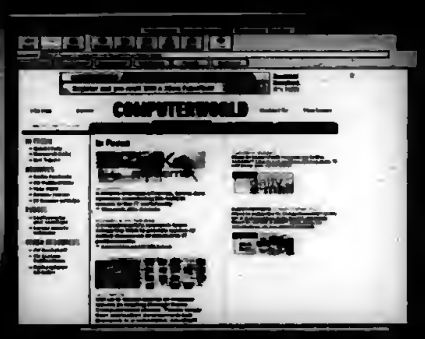
DR. SOLOMON'S SOFTWARE, INC. has announced Anti-Virus Toolkit for Solaris, antivirus software ported to servers running Sun Microsystems, Inc.'s Solaris operating system.

The Burlington, Mass.-based company said the tool kit contains FindVirus, a virus scanner that detects, identifies and disinfects new and unknown viruses by looking for virus-like code. When a virus is identified, an alert goes out to the server manager. FindVirus also can scan inside multiple layers of compressed and archived files, where viruses are often hidden.

The Solaris tool kit is a component of Dr. Solomon's Anti-Virus Toolkit for Servers, which costs $599 per server.

Dr. Solomon's Software
(781) 273-7400
www.drsolomon.com

online product info



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Briefs

North American digital signal processor market

1996	[illegible]
1997	[illegible]
1998	[illegible]
1999	[illegible]
2000	[illegible]
2001	[illegible]
2002	[illegible]

Includes chips for cellular telephones, telecommunications systems, modems, network equipment, consumer electronics, office equipment, automobile engines and power trains, robots and machine vision systems.

* Projected

Source: Allied Business Intelligence, Inc., Oyster Bay, N.Y.

Intel hits 0.18 microns

Intel Corp. said it is moving ahead on future chip lines based on its 0.18-micron technology, which will appear in processors next year. (Current processors are based on 0.25-micron technology.) Intel is also working ahead of its original schedule in delivering its relatively cheap Celeron processors, company officials said. Intel also said last week that it will introduce a pair of chipsets designs for graphical workstations.

Dell midrange server

Dell Computer Corp. planned at press time to announce a midrange server. It will be based on Pentium II technology and aimed at higher-end corporate environments.

Compaq, Dell sales tie

Compaq Computer Corp. and Dell are neck-and-neck in the race to be the top seller of PCs in the U.S., according to the latest figures from International Data Corp. in Framingham, Mass., and Dataquest in San Jose, Calif. Compared with a year ago, sales in the U.S. rose about [illegible] in the quarter ended June 30.

Dell has long been No. 2 in sales [illegible] that for No. 1 with [illegible] that quarter, [illegible] worldwide, [illegible] on top in [illegible] No. 1 at [illegible] Hewlett-Packard [illegible] Inc. [illegible] Inc. [illegible] roughly 7.7% of the market.

The FAA is the poster child for year 2000 problems

• One more air traffic system tested, 75 to go

IBM, others question FAA's 2000 progress

By Matt Hamblen

THE FEDERAL AVIATION ADMINISTRATION recently claimed 40 of its aging IBM mainframe computers have been successfully tested and are year 2000-ready, but the mainframe vendor and an industry analyst are skeptical.

After months of being criticized for falling behind on year 2000 work, the agency recently said the IBM 3083s at 20 air traffic control centers were tested for three months and found to handle the date change [CW, July 27]. Those water-cooled mainframes are used to relay data from radar to the screens of air traffic controllers and represent just one of the FAA's 225 mission-critical air traffic control systems. IBM advised the FAA to replace the mainframes last October, warning that the skills and tools to do a complete year 2000 test weren't available.

IBM refused to endorse the FAA's tests. "We're not in a position to pass judgment on their tests because IBM was not involved in their testing," IBM spokesman Mark Nelson said. "IBM's position is that [the 3083s] should be replaced because of age and scarcity of parts. . . . They're not year 2000-compliant."

Coline Rankine, an analyst at Giga Information Group in Cambridge, Mass., questioned the FAA tests of the 3083s. "It's possible that they do understand where the year 2000 ex-

IBM, page 54

Users favor notebooks for productivity gains

By Kim Girard

CORPORATE IT DEPARTMENTS are increasingly allowing users to choose: notebook or desktop PC?

The reason? Notebooks, once an expensive and coveted information technology resource often only loaned out to employees, have plummeted in price in the past year and are credited by analysts with making employees more productive.

An increasing number of corporate clients are inquiring about moving desktop users to notebooks, despite the fact that notebook users cost more to support, said Ken Dulaney, an analyst at Gartner Group, Inc. in Stamford, Conn. Typically, the increased productivity outweighs that extra cost, he said.

Arguing that higher productivity is worth the added price, HBO & Co. in Atlanta has

Notebooks, page 54

Users warm to sub-$1,000 PCs

By April Jacobs

INITIALLY COOL to the prospect of a sub-$1,000 PC market, some companies are now finding the machines a smart buy for users who don't need costly bells and whistles.

Some users say they are finding sub-$1,000 models that fit their needs. But others are haggling or leveraging their buying power to lower the cost on more expensive models closer

Sub-$1,000, page 54

Sub-$1,000 PCs may be a good choice for:

- Environments where users need basic applications and Internet access
- Non-power users, such as those in administration and support areas
- Companies with quick hardware upgrade cycles

MCI's new mainframes to save $30M in costs

By Jaikumar Vijayan

FIVE MILLION DOLLARS this year. And $5 million more for each of the next five years — $30 million in all.

That's the kind of money MCI Communications Corp. hopes to shave off its operating costs as a result of its recent migration from IBM water-cooled mainframes to newer CMOS systems.

The savings will come from reduced maintenance and support costs as well as lower software and energy costs, said Chuck Shellhouse, director of server operations at MCI in Colorado Springs. For instance, maintenance costs on a 480-MIPS water-cooled engine can run $40,000 to $50,000 per month compared with $10,000 to $12,000 on a comparable CMOS system, he said.

A mix of mainframes from IBM and Hitachi Data Systems Corp. power almost all of MCI's core applications, which range from billing and order-entry systems to engineering and network management applications. MCI just completed a massive six-month transition

from 19 old mainframes to 17 of IBM's current-generation CMOS processors, in what the company described as one of its biggest data center technology upgrades ever. It declined to estimate that cost.

The move was driven as much by a need for extra performance as it was by pressure to reduce data center operations costs, Shellhouse said. MCI is in the midst of a broader data center re-engineering and serv-

MCI, page 54

IBM skeptical of FAA

CONTINUED FROM PAGE 53

postures are, but their test doesn't give me a warm fuzzy," Rankine said. "I am not going to take a flight that week, and I'm serious."

Despite IBM's warning last October, the FAA decided to conduct its own tests of the mainframes, even as its upgrade effort was under way to replace all the machines before year 2000, according to Paul Takemoto, a spokesman for the FAA.

Two retired IBM programmers hired by the FAA and several agency employees checked about 5 million lines of microcode to see if the date change would force a shutdown of the mainframe's cooling pumps, Takemoto said.

They found that the microcode processes years as a number between one and 31, assuming 1975 (the year the mainframes went online) as Year 1. That means the system would fail Jan. 1, 2007, not 2000.

REPLACEMENT PLAN

Whether that finding proves accurate or not, IBM is on a schedule to replace all the 3083s with IBM 9672 mainframes by June 1999, Nelson said.

Rankine said the 3083 problems could go beyond the 32-year counter. "The concern is the software in the operating system," Rankine added.

Takemoto said the saving grace of the FAA will be its backup systems. "Believe it or not," he said, the FAA has backups for all 225 air traffic control systems, one of which is for the 3083s, and all the backups are compliant.

The FAA has set June 1999 as the target date for having its systems ready. Overall, the FAA has 655 systems; 433 are considered mission-critical, including the 225 that govern air traffic control systems. Of those 225, 75 still require renovation, Takemoto said.

The FAA's timetable was roundly criticized by Congress in the spring, and the agency has been the butt of some gibing by John A. Koskinen, director of the president's Year 2000 Conversion Council. In a speech to bankers in New York in June, Koskinen said, "The FAA has become the poster child for year 2000 problems" because of the dire predictions by doomsayers of planes falling from the sky.

But in an act of faith in the agency and in contrast to the views of analysts such as Rankine, Koskinen has repeatedly said he believes the FAA's backup systems will be year 2000-compliant and he will even take a flight to New York on Jan. 1, 2000. □

Users warming up to sub-$1,000 PCs

CONTINUED FROM PAGE 53

to $1,000, building their own or turning to private labels to reach that price.

"We have consolidated citywide purchasing, and we go to Tier 1 vendors like IBM, Dell, Compaq and [Hewlett-Packard Co.] with bids on a quarterly basis. And through that, we have been able to get our pricing down below $1,000," said Brian Anderson, chief information officer for the city of Philadelphia.

He said having about 55,000 people in the city's user base helps. But it wasn't always that way. Until the city put a consolidated purchasing system in place, various departments bought PCs on their own — and the costs were higher.

"We're now very focused on total cost of ownership, and this is one way of keeping costs down," Anderson said.

Using private-label PCs assembled through local vendors can be another way to keep capital costs at a minimum, according to another CIO.

"We've been able to increase the performance of our PCs without paying more for them," said Paul Tinnirello, CIO at A. M. Best Co., a retailer in Oldwick, N.J. He said relatively expensive Token Ring network interface cards, which cost about $200, bring the average PC price to about $1,100. But the PC itself is less than $1,000.

Tinnirello said he uses PCs from Dell Computer Corp. for higher-end users who need a lot of power and memory on their desktops, but those who can use less-capable machines get ones from a local PC builder that come custom-built to A. M. Best's specifications.

AVOID OLDER MACHINES

But Tinnirello advised against buying PCs that are cheaper simply because they are outdated; those become obsolete too quickly. His PCs range in speed from 233 to 300 MHz, using Pentium II processors.

Vendors have been flocking to the sub-$1,000 PC market — mostly aiming their efforts at individual consumers. But with prices falling ever lower over the past two years, corporate buyers are becoming more aware that lower cost doesn't necessarily mean lower performance.

Sub-$1,000 PCs can make sense for users who need access to lighter application loads such as E-mail and simple word processing, said Martin Reynolds, an analyst at Dataquest in San Jose, Calif.

Most buyers can find higher-performance Pentiums and even Pentium II-based systems, typically with at least 2G-byte hard drives and 32M bytes of RAM, for close to, if not less than, $1,000. What they won't get for that price are CD-ROM drives and network cards. □

Older PCs are cheaper, but they grow obsolete quickly

Users favor notebooks over PCs

CONTINUED FROM PAGE 53

added 1,000 notebooks during the past year, for a total of 3,500 notebooks and 6,500 desktops, said Joe Federer, the health care company's vice president of information services.

"The prices are what we used to pay for desktops," Federer said, noting that he now can get a fully loaded Toshiba America Information Systems 730CDX series Tecra notebook for $2,500, compared with a 300-MHz Gateway, Inc. desktop, which costs about $1,200.

By using notebooks, "we're getting more done with the same or less people even though the workload increases because we're giving them the power to work anywhere, anytime," he said.

Though the company has never tracked productivity of notebook vs. PC users, Federer said, with notebooks, "it's just a gut feeling that it makes sense."

Asmar Madyun, technical support manager at AT&T Corp.'s Solutions division in Warren, N.J., said about 40% of the group's users have chosen either Compaq Computer Corp. or Toshiba notebooks, and employees typically choose whether they want a desktop or notebook.

They now are choosing notebooks particularly because the machines are getting lighter and more powerful, he said. "Two or three years ago, I would have thought about nothing but a desktop," he said. "Now, they want a notebook."

Notebook prices also continue to plummet, though they remain about twice the price of a desktop PC.

Compaq, for example, recently cut prices on its Armada line by up to 26%. A higher-end Armada 7730DMT with a 233-MHz Pentium processor, for example, now costs $2,499 — slashed nearly 20% from $3,119. Likewise, IBM now is offering a notebook that costs just $1,889. Dell prices start at $1,999. □

MCI

CONTINUED FROM PAGE 53

er consolidation effort aimed at improving customer service. MCI, which has 12,000 MIPS of mainframe processing power installed at its four data centers nationwide, moved to the CMOS machines in February.

CMOS systems — which started shipping in 1994 — offer huge savings in space and energy costs compared with older water-cooled mainframes. Despite such advantages, early CMOS machines didn't offer the same horsepower as the much bigger water-cooled systems they were meant to displace. In the past two years, however, systems such as IBM's Generation 4 and recently announced Generation 5 machines have begun not only to match but actually double the performance of older systems.

"CMOS machines don't require much more energy than a standard PC, are more reliable and take up a fraction of the space required by a [water-cooled] system," said David Floyer, an analyst at International Data Corp. in Mountain View, Calif.

SPACE SAVER

In fact, the machine takes just one-tenth the floor space of its predecessor and likewise consumes about a tenth the energy. That's because the technology used in CMOS chips, or Complimentary Metal Oxide Semiconductors, is the same as that used in mass-volume chips such as those from Intel Corp. It requires less power and cooling compared with the bipolar technologies that earlier mainframes were based on.

The space saved also will allow MCI to relocate several of its large Unix servers from across the country into its four data centers. The Unix servers run applications such as data warehouse and financial systems.

There are further savings in software license charges. Because MCI has tied all its mainframes together into one giant cluster using IBM's Parallel Sysplex clustering technology, the company is eligible for IBM's heavily discounted Parallel Sysplex Licensing Charge. Instead of assessing software charges on a per-mainframe basis, the pricing system allows customers to cluster multiple mainframes and claim a licensing discount on the aggregated whole. □

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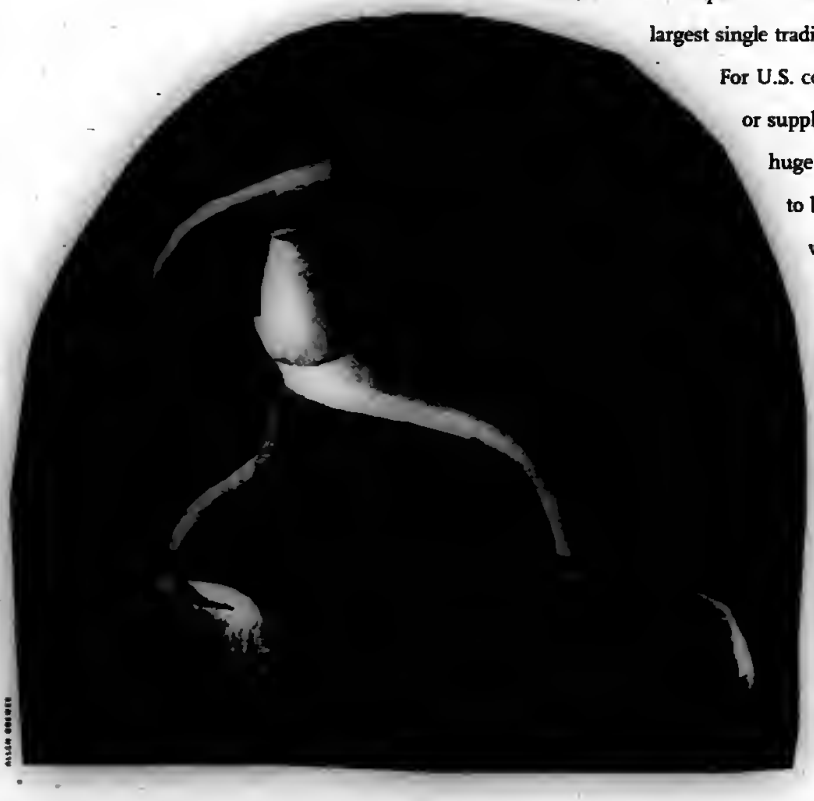
Pointless debate
Paul Strassmann finds
much ado about noth-
ing in estimates
of your 2000 costs.
Page 59

EURO TRAPS

BY KATHLEEN MELYMUKA

The single European currency debuts in less than five months. Here are 10 IT 'gotchas' that'll 'getcha' if you're not ready

When the world begins its transition to the euro on Jan. 1, 1999, the 11 "in" nations of the European Economic and Monetary Union (EMU) will become the largest single trading partner of the U.S.



For U.S. companies with divisions, subsidiaries, customers or suppliers in Europe, the transition to the euro poses a huge challenge. About 3 million applications will need to be adjusted, says Capers Jones, chairman of Software Productivity Research, Inc. in Burlington, Mass. Those include systems for accounts receivable and payable, billing, cataloging, costing, electronic data interchange, general ledger, inventory, manufacturing, order processing, payroll, pricing and tax reporting.

And that's just the beginning. Beyond the technical problems are business challenges the world has never had to deal with before..

It isn't surprising that many folks in America's IT trenches are unsure of what the euro may mean to them. But we found a few chief information officers, euro project managers and

consultants — and they say some "gotchas" may not be apparent from across the Atlantic. Here are a few:

1. DOUBLE BOOKKEEPING

As of Jan. 1, 1999, U.S. companies should be able to accept and remit payments in both the euro and local currencies, says Eric Sagerman, senior vice president for international product development at American Express Co. in London. "The task of adjusting your back-room systems is large," he says. "We've had a team on it for 18 months, ensuring we're ready. If you haven't looked at that yet, I suggest you look at it quickly."

Although, theoretically, you have a three-year window to use either currency while you get your systems in order, you may find your company compelled by outside forces. Financial regulatory agencies, for example, are implementing rules to ensure that financial institutions move fast. "We will be in an all-euro universe on Day 1," says Robert L. Pierre, vice president of global operations at State Street Bank and Trust Co. in Boston. "Anything else is an illusion."

Even in the commercial world, the "wiggle room" may be theoretical. "Some European companies have been 'inviting' their suppliers to do business in euros," says Nick Jones, vice president and research director at Gartner Group Europe in London. "If your biggest customer 'invites' you to do something like that, you do it."

Jack Cooper, CIO at Bristol-Myers Squibb Co., the New York-based pharmaceuticals giant, says many firms already keep accounts in multiple currencies, so the euro won't be a big change. For others, there is a workaround: have financial institutions do the work for you.

2. CAPACITY PROBLEMS

During the transition, firms must consider if they need to keep two sets of books, says Evelyn Fuhrer, a partner in the financial services technology practice at PricewaterhouseCoopers in New York. If so, you'll be sending twice as much information. Can your network handle that? And logistically, does your billing database have fields for another currency? Is there room on your customer account screens and paper invoices? Will intranet, extranet or World Wide Web pages need to be redesigned?

3. TRIANGULATION

If you want to convert from dollars to deutsche marks today, you simply multiply by the conversion factor. But starting next year, euro currency rules require that each currency must first be converted to euros, then to the local currency: dollars to euros; euros to deutsche marks. Few accounting systems had that function until this year, Nick Jones says, "so even if you have a multicurrency system, it probably won't work."

4. CODING AND FIELD CHANGES

The euro requires that you keep six figures to the right of the decimal point, so fields designed to accommodate prices such as 5.99 will have to be expanded to 5.990000.

5. PRODUCT ADJUSTMENTS

If you're using psychological pricing — such as 3.99 francs, which customers are supposed to think of as more like three francs than four francs — it won't work after the euro transition because the value will be different, Nick Jones says. Your 3.99-franc bottle of detergent may turn out to be worth 4.50 euros. To get down to 3.99 again, you'll need to shrink the size of the package or use less costly ingredients in the current size. In the first scenario, packaging systems will need to be changed; in the second, manufacturing systems.

6. DOUBLE-DUTY CURRENCY CODES

You'll need to change currency codes in applications from the local currency, say French francs, to the euro. But beware of double-duty currency codes: Often, the currency code in a system is also used to designate the country of origin, Fuhrer says. By replacing the French franc code with the euro code, you could be deleting the only reference to the country from which a document came.

7. PRICE TRANSPARENCY

A U.S. manufacturer can now price a product differently in Germany, France and Italy, and it won't be apparent, says Anthony Marsicovetere, senior manager for international banking at KPMG Peat Marwick LLP in New York. "I can hide differences in profit margin or operational costs in the [different] currency," he explains. For example, prices of compact discs may be higher in Italy than in Germany because of transportation and handling costs, retail markups, tariffs or just higher profit margins. But Germans and Italians don't know that unless they go through the exercise of figuring out the exchange rates.

With all prices in the euro, however, customers can comparison shop throughout Europe. That will require a total rethinking of price strategy, Marsicovetere says. Will you risk the survival of your markets in high-priced countries? Will you go to a common high price and lose market share to competitors? Will you go low and lose revenue? Finally, are your systems prepared to provide the kind of information needed to support these kinds of decisions?

8. LOGISTICS

"If prices go down, companies will have to cut costs somewhere else," says Michiel Van der Lof, senior manager at Ernst & Young LLP in New York. You may have to find cheaper supply sources or move production plants. You may need to move offices and plants from outside the euro zone to inside, where there are no exchange-rate barriers. That could require the dismantling and rebuilding of entire systems — not to mention the IT workforces that support them. Can you move your German workforce to Spain? If not, can you find the skills you need there?

9. ERRORS AND FRAUD

Users know how many lire are in a pound, but no one is used to the euro. "You're changing the magnitude of currency, so staff won't have an intuitive mental model of what should be," Nick Jones says. "People are more likely to miss fraud, and that increases the risk." Cooper takes that one in stride, however. "There will be a need to have training and controls," he says, "but everything you do opens it up for fraud. If you're too concerned, you'd never change a system."

The dangers for U.S. firms are heightened because the ratio of the euro to the dollar will probably be about 1.1-to-1. Because the values are so close, mistakes and fraud will be harder to notice. "Subsidiaries in Europe are likely to see increased levels of computer fraud," Nick Jones says.

10. BURNED BRIDGES

What if an EMU nation no longer meets the euro criteria, or opts out? "We're suggesting that clients think about reversibility," Fuhrer says.

If a country opts to go back to its old currency, will your company have kept enough information to be able to support the reversal? Make sure whatever systems you change can be changed back, if necessary. □

Melymuka is Computerworld's senior editor, management.

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•The Euro: The Real Millennial Challenge (Global Innovators Series — June 1998)
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But wait! There's good news!

American euro project managers are concerned about euro "gotchas," but are enthusiastic about euro opportunities.

"There are things that may bite you, but the best defense is a strong offense," says Jack Cooper, CIO at Bristol-Myers Squibb in New York. "The more important thing is the hidden opportunities."

Here are a few:

Bristol-Myers' Jack Cooper: "Best defense is a strong offense"

▸MORE BUSINESS
"Think about the opportunities for you," says Eric Sagerman, senior vice president for international product development at American Express in London. For example, Amex sees credit-card purchases soaring over the transition period for two reasons. "People will begin to make more cross-border purchases than they do today, both consumer and business," Sagerman says, because price transparencies will highlight better deals across borders. Since many of those purchases will be over long distance, credit cards will be the payment method of choice for many. Also, people who want to use euros will have to put purchases on plastic because there will be no physical euro currency.

If your company stands to gain, make sure your systems are ready to meet the challenge.

▸SAVINGS
Today, the costs of European currency conversions are substantial from the standpoint of both systems and manpower, Cooper says.

"That's all back-room, non-added-value work," he says. "With the euro, it all gets eliminated. You streamline your administration and increase your ease of doing business."

▸LOCAL COMPETITORS AT A DISADVANTAGE
The euro provides a great opportunity to take business from European companies that operate in just one country. While they're adjusting to operating with a different currency, multinationals that have worked with many currencies can seize the day, says Robert J. Frane, senior vice president at Booz Allen & Hamilton, Inc., a New York consulting firm.

— Kathleen Melymuka

FINDING *the* KEEPERS

How do you hire the right person for the job? Try these hard-nosed interview questions

By Alan S. Horowitz

How do you find the best job candidate from your top applicants?

They all have the right skills and background. But what if your decision hinges on how the new hire works with people or how he responds to certain situations? By asking some of these to questions we've culled from information systems managers, you'll find the creme de la creme.

1. If you have two comparable programmers or analysts, on what basis would you promote one over the other? Paul Apostle, vice president of applications development at Medical Mutual of Ohio in Cleveland, often asks this of prospective managers. "I'm looking for metrics, hard facts, rather than gut reaction," he says. "There aren't a lot of people out there who measure the hard facts. Those are the people I want."

An example of the kind of person he wants is a manager who tracks target dates and can cite how often the programmer or analyst hits them.

2. Which would you prefer: to enter a project at the outset and stay with it through post-implementation, or to be handed the specifications and take it from there? What Tom McElveen, an IS director at Carilion Health System in Roanoke, Va., is looking for is where the person should be placed. "If they want to just be a programmer, getting the specs and taking it from there is the right answer. If they want to be a program analyst, they need to get involved early in a project," he says.

3. Is the client always right? This is another McElveen favorite, and he isn't looking for a "yes" answer. "A good answer," he says, "is 'The client is not always right.' I want someone who can play devil's advocate with our clients so they think of all the alternatives."

4. What was your most rewarding project and what did you contribute to it? Dave Cornine wants to get at passion. Cornine, director of applications development at BMG Entertainment in New York, says: "If I get an extensive response, where they explain it in complete detail, then they have a passion for more than the technology. [They understand] the business aspects [of the technology] and how it applies."

5. If you come to work for me today, and six months later you wake up one morning and say, 'Oh my God, what have I done? This is the biggest mistake I've ever made,' what would cause you to have that kind of reaction? Keith Bearden, information services manager at dental equipment maker A-dec, Inc. in Newberg, Ore., likes this question. "I've had people say, 'That's an impossible question. You're asking me to read the future.' Others say, 'Oh well, circumstances could change. I could get a better offer.' " The answer he's looking for — and rarely gets — is: "If I come here and you don't let me do my job, you micromanage me, then I'll leave." Bearden says: "That's the kind of answer you're looking for: what work environment they want to exist in."

6. What do you do for fun? This is a favorite of Dan Bent, CIO at Benefit Systems, Inc. in Indianapolis. "If they say, 'Oh, I send E-mail to my friends, and I'm browsing the Web in most of my spare time,' I'm saying, 'This is a guy who is crazed. He loves the stuff. I want him.' " Bent doesn't disqualify someone who does nontechnology things, but he says, "The kind of guy I like to hire is a guy who is absolutely driven to do more with his PC than what he's doing now. That guy is going to be geared to learning, to finding his own answers."

7. Describe what "leadership through quality" means. John Zimmerman, manager of employment and development at Xerox Corp., asks this to find out attitudes toward change, if applicants have read books on change and how they plan to deal with change. The industry is changing rapidly, Zimmerman says, and the question helps him explore how receptive the applicant is to change.

8. Where did you grow up? What is your work experience to date? What do you know about Home Depot and the work you would be doing here? Why should I hire you? Ron Griffin, senior vice president and CIO at The Home Depot, Inc. in Atlanta, sometimes asks these four questions (or others) in rapid-fire succession, without providing a chance for a response until finishing the last question. "Part of what I'm evaluating is how well they listen and how well can they organize their thoughts to come back with cogent, crisp responses. It gives me a good indication of their thinking and communication skills," Griffin says.

9. What projects have you ever undertaken that were met with resistance and how did you overcome it? One of the best answers that Alan Cranford, vice president of operations at Tenent Healthcare Corp. in Dallas, ever got to this question was from a manager who called a steering meeting, laid out why he wanted to do the project and its benefits, listened to others' concerns and came up with a compromise. "That tells me he's looking out for the best interests of the company and he's open to listening to the concerns of end users. And he doesn't take 'no' for an answer," Cranford says. A poor answer? "I gave it my best shot," or "I couldn't get the budget."

10. Situation questions such as: There was a segment system outage. How would you communicate to a customer who was irate? Frank Petersmark favors those questions. The assistant vice president of information technologies at Amerisure Cos. in Farmington Hills, Mich., will ask them of someone interviewing for a technical management position. The answer provides insights into the applicant's personality and how he behaves under stress. □

Horowitz is a freelance writer in Salt Lake City.

MORE ONLINE

For more hard-nosed interview questions, look to our Web site for these IT Careers section stories, written by John Kador, author of *The Manager's Book of Questions: 75 Great Interview Questions for Hiring the Best Person* (McGraw Hill, 1997)

•Killer Questions (Feb. 3, 1997)

•More Killer Questions (April 21, 1997)

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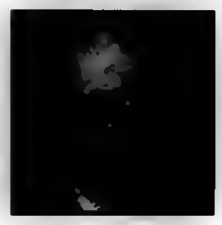
YEAR 2000 COSTS: MAKING SENSE OF A SENSELESS DEBATE

PAUL A. STRASSMANN



How much will it cost to fix the year 2000 problem in the U.S.? Some calculate $55 billion; others say $300 million. I say the debate is pointless.

disguising and deferring costs, companies can declare and hit any year 2000 budget they estimate. What matters much more is having a consistent and defensible approach to avoiding the two-digit doomsday.

DO YEAR 2000 COSTS VARY?

When I compared year 2000 costs — reported in recent Securities and Exchange Commission filings — I found that they were unrelated to a firm's revenue or industry.

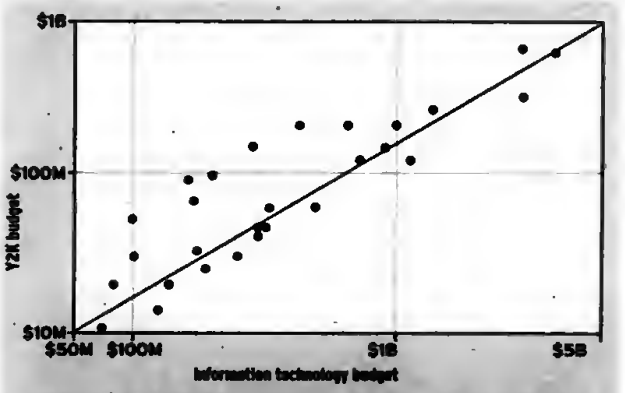
However, there was a straight-line pattern when year 2000 costs were plotted against the same company's information technology budget.

It revealed large variances in year 2000 costs for comparable retailers and banks (see chart):

Why would some firms report twice as much in year 2000 spending as the trend line?

How come some firms get away with spending up to 30% less?

It's all a matter of technique and budgetary artistry.



A pattern of inconsistencies: There's a disparity in some year 2000 spending. Even companies of the same size fall well above or below the year 2000 budget trend line (in red).

COSTS OF REMEDIATION

The most plausible explanation is how a firm approaches its year 2000 problems.

There are nine basic ways of solving the problem, as defined by the IEEE standard for year 2000 terminology (see *http://grouper.ieee.org/groups/2000/p2000-1.doc*). Many of these methods are cheap to execute but unreliable and expensive to maintain after the year 2000 victory party.

Other techniques are expensive and hard to deliver because they call for altering business processes. They promise lower long-term maintenance costs but risk not completing the job in time.

The cost disparities can also be traced to the differences in how companies account for life-cycle costs.

The Federal Accounting Standards Board has ruled that year 2000 costs must be charged to current operating expenses rather than capitalized, which increases the reported expenditures.

Some corporations have found clever ways to reclassify year 2000 fixes as depreciable "business process improvements," which will lower what they will report as year 2000 costs.

At the other end of the budget legerdemain are plans that depend on now-you-see-it-now-you-don't techniques such as "year shifting."

That would involve replacing the offending dates with something workable, such as backdating everything to 1972. It's a quick and easily automated bargain-basement remedy; costs for it have been as low as 35 cents per line of code. But this approach disguises the ultimate price for restoring phony data and contrived applications to a condition where they can operate reliably for decades to come.

Another source of distortion comes from the reliance on the "line of code" metric for estimating year 2000 costs. Counting lines of code will always be misleading, regardless of the unit prices quoted by the popular IT advisory services.

Lines of code don't recognize that what really matters is only logical code, its complexity and whether that code is in microcode, assembly language, Cobol or Smalltalk.

Using average lines of code pricing is like using average dollars per pound to estimate the cost of an airplane or a motorcycle.

MANAGEMENT IMPLICATIONS

One thing is certain: Actual year 2000 costs will definitely not be what year 2000 program managers claim.

Rather than worry about the figures released to the public, corporate management, auditors, year 2000 project managers and the SEC should instead focus on documenting an intelligent and consistent approach to planning, scheduling and implementing the year 2000 readiness program.

Lawyers will use inconsistencies in preparation of year 2000 cost estimates as one proof of managerial neglect to provide adequate resources that would thwart year 2000 damages.

Cost estimation worksheets will be extracted from the project proposal documents during pretrial intrusions into the files of contractors, consultants and customers.

Only by showing consistency can management beat back these legal attacks. As an added precaution, managers will also have to demonstrate that their resource requirements have been independently validated.

Together, this will demonstrate that due diligence has taken place in coping with managing what are inherently flawed computer assets.

It isn't what you will spend on the year 2000 problem that has much meaning. What matters is that you have a consistent, thorough and defensible approach to solving it. It's the only way to gain a proper perspective on year 2000 budget estimates. □

Strassmann (ceo@stacorp.com) finds that what we see as the reported year 2000 costs are only the "pay now" portion of a "pay later" bill.

Inside: A review of three typical commerce suites.
Page 62

Review Center

Commerce server software

Selling to Surfers

Commerce suites can help your company sell on the Web, but be aware they're still immature

By David Strom

Creating a World Wide Web storefront for your company requires a new breed of renaissance information systems manager. You need to be part programmer, part Web designer. Then you need a solid understanding of banking technologies and accounting techniques. And that's just for starters. Evaluating the choices and finding all the right products to buy is time-consuming and frustrating. Most likely, the skill you'll depend on most is the patience to get everything working.

It isn't like deploying Microsoft Office throughout your company. Electronic-commerce products are far from mature. Although there are many choices and competition runs high, the overall level of finish on these products is unsatisfactory. Matching the right product to your company, in terms of scope, features and abilities isn't easy, either. On top of those challenges is a fast-moving standards scene: You need to keep track of several standards and understand which versions and portions are supported by your chosen products.

There are three basic approaches to storefronts. First, you could try to assemble your own products that handle basic storefront functions such as a Web-based catalog, a shopping-cart and checkout system, and payment processing and billing. That puts the burden of integrating all those pieces squarely on your shoulders. That won't be very attractive if your IS staff is running flat out on year 2000 issues. A second option is to outsource all or part of the storefront to a Web commerce provider or electronic mall. That method has its drawbacks as well because you lose some control over the design and operations of your store and because you might end up paying high monthly fees. Or you could purchase a suite of software that claims to integrate those functions into a single box.

On the surface, suites seem to make the most sense: You don't have to pull together your own package, and you can avoid monthly rental charges. But the more you dig into suites, the more you come across their limitations. For a hands-on look at some representative products from three major vendors, see the Client/Server Labs review of suites from Open Market, Inc., IBM and Microsoft Corp. on page 62.

All electronic-commerce suites have several elements in common. They provide a relatively simple

set of tools to run your store via a browser. Some products, such as IBM's Net.Commerce, require a particular browser version — Netscape Communications Corp. Communicator 4.04 with the Java Development Kit (JDK) 1.1 patch, in IBM's case — for store administration, but most of them are less picky. These tools allow you to make changes to your online catalog and storefront design, check inventory levels and view reports. All suites come with built-in shopping cart and checkout modules. Those are useful for shoppers as they navigate through the store and select items to purchase.

Trying to track down prices on these products requires some sleuthing. Vendors aren't always forthcoming about the fine print. Some products, such as ICat Corp.'s ICat Commerce Online and Net.Commerce, come in multiple versions with different feature sets. Both O'Reilly & Associates' WebSite and ICat support only a single storefront with their suites, and others, such as Intershop from Intershop Communications, Inc., charge extra if you want to host more than a single storefront per server. Most enterprises won't have to worry about that, but it is something to consider.

The suites differ in five areas: ease of configuration and setup, database and scripting support, payment processing, sample storefronts included, and workflow management. Let's look at the features and key benefits of the products in more detail, based on my hands-on work with these and other key electronic-commerce products during the past few years.

CONFIGURATION/SETUP

Setup of suite products ranges from simple to excruciating. Domino Merchant takes the prize for best configuration: A few clicks and an hour or so later, several hundred megabytes of software are fully installed and for the most part operational. It's impressive, considering you get a fully functional Notes server as part of the deal.

DATABASES AND SCRIPTING

Setup is certainly important, but the real meat of the suites is how they handle their databases and scripting. Behind every good storefront is a solid database, and in an ideal world that suite should integrate into your existing enterprise data structure. You also want the suite to support a programming language you already know, such as JavaScript or Perl. Unfortunately, all the suites fall down in this area, offering limited database and scripting support.

Each suite comes with a bundled database, and you should make use of whatever is included, at least on the first installation. Domino Merchant comes with Notes. Net.Commerce relies on IBM's own DB2, and Site Server Commerce on SQL Server. Intershop comes with Sybase. Inc.'s Adaptive Server, and ICat uses the single-user version of Sybase. WebSite Pro makes use of Microsoft Access databases. None of the suites runs natively on Oracle Corp. databases, which is a big drawback, given Oracle's market share.

But that's just the tip of the database iceberg. Trying to figure out the data structures for your storefront isn't easy: Other than WebSite, none of the others really does a competent job documenting its data dictionaries and tables. If you want to make use of other databases, each product supports Open Database Connectivity. But getting that to work can be daunting. And each suite has its own scripting language, which could require a steep learning curve to make even minor changes. With Intershop, you need to learn three languages as you set up your store. It comes with its own language, called Template Language Extension, used to design the store, and has pieces written in Perl and JavaScript for other store functions. That's a lot for a programmer to handle.

PAYMENT STYLES

Payment processing is another differentiating area. Each suite supports a different number of payment systems (see box at right): CyberCash, Inc.'s CashRegister and Verifone, Inc.'s VPOS are the most popular systems. One or both are supported by all major vendors. Intershop supports the widest number of payment options, accepting checks and even cash. Others are more limited: WebSite, for example, supports only a single payment method per storefront.

SAMPLE STOREFRONTS

Each suite comes with one or more sample storefronts. In some cases, such as with Net.Commerce, you can set up your sample store but not necessarily populate it with any products. That's useful if you want to leverage the design and use your own catalog. But adding products to your store can range from mildly annoying to vexing. You have to manually add items to your Domino Merchant catalog, even if those items are already ensconced in some Notes database. Intershop has the best import facility, with clear documentation and an automated wizard to walk you through the process. Net.Commerce and ICat fall somewhere in between.

WORKFLOW MANAGEMENT

Finally, there are workflow management issues.

None of the suites is very good at creating a clear separation of the tools for different tasks. Just as in operating any physical storefront, there are different people who handle the accounts, stock the store with products and review the day's sales reports. Intershop does the best job in terms of providing different series of screens for these tasks, and Net.Commerce comes in a close second. But both products are still far from ideal in terms of making it easy for multiple store administrators to avoid stepping on one another's toes.

THE FUTURE

Given this state of affairs, where is the suite market going in the next two years? Well, there's plenty of room for improvement when it comes to software quality. Better and more documented database support would be first on my list; easier integration into your existing accounting and financial back ends would be a close second. Internet service providers could pick up some of the slack here and act as integrators or value-added resellers of the suites, and several — such as Mindspring Enterprises, Inc. and PSINet, Inc. — have already stepped into that role. This could become a big market, if Internet service providers did more than just operate server farms and had experienced programmers with skills covering commerce, banking, and database development. But that may be asking too much.

Encanto Networks provides a look into the future. The company provides a complete turnkey electronic-commerce server. You plug it in, turn it on and set it up with a browser. It has payment systems, a catalog and other storefront operations all built-in. Whether this will be competitive with the suites remains to be seen. In the meantime, evaluate the suites carefully. Given all the caveats, building your own setup may be more attractive. □

Strom teaches seminars on electronic commerce at conferences around the world and has tested many of the suite products. Check out his Web site at strom.com/pubwork/ecommerce for links to other resources, books and product demonstrations.

PAYMENT PRIMER

The biggest challenge confronting Web storefront builders is how to handle payments. The trick is to make it easier for shoppers to buy your merchandise but have the same controls and systems that you would use for any physical storefront.

Before you decide what to do, you'll need to answer some questions.

■**Do you assume that customers will want to pay with credit cards?** That's the most popular method, although many merchants also offer other payment mechanisms. Those include faxed order forms and several electronic-cash payments such as CyberCash and First Virtual Holdings' VPIN. Although electronic-cash products have fallen out of favor, those who still want to support them will need to make sure their electronic-commerce suite can be configured properly.

■**How much screening and fraud protection do you need?** Payment products vary in what they check after a shopper submits an order. Some match credit-card numbers with the address, some ensure that the number isn't on a list of stolen or fraudulent cards, and others don't do more than a checksum of the credit-card number itself.

■**What fees are involved?** Some products, such as CyberCash's CashRegister, just charge the merchant banks a fee for processing each transaction and are free to the storefront owner. Others, such as Clear Commerce, charge $75,000 or more for their software.

■**Will your payment system work with your bank and your electronic-commerce suite?** You may have to change banks, reconfigure your software suite and get into the guts of your suite's scripting tools to make it all work.

■**Does your payment system perform real-time submissions of orders and have the ability to actually commit the funds to your account?** Early versions of Verifone's VPOS didn't, for example. That meant each order had to be submitted manually — a time-consuming task.

■**What kinds of reports are produced?** Some systems deliver too much data (with no ability to sort or filter it), and others are very skimpy on reports. Most systems don't integrate their reports into your back-end accounting software, which means you'll need workers to either retype or check that information.

— David Strom

Tests by Client/Server Labs and *Computerworld* show that suites have taken some of the sweat out of a commerce site, although they have a ways to go

E-commerce

IBM

VENOOR: IBM
ADDRESS: Armonk, N.Y.
PHONE: (800) 426-2255
WEB: www.software.ibm.com/commerce/

PRODUCT: Net.Commerce Pro

TESTEO PLATFORM: NT 4.0 Server

PRICE: $19,995

PRO: Ability to arrange stores into a virtual mall

CON: Somewhat clumsy administration tools

BEST FIT: Organizations already using DB2 and/or a Domino-based Web service

OVERALL IMPRESSION: The lack of finesse in administrative tools made getting even a basic site running more of a challenge than expected

Creating commercial World Wide Web sites that can handle product catalogs, customer information, billing systems and transaction processing isn't the stuff of yesterday's simple Hypertext Markup Language (HTML) pages. A maturing class of server products has emerged in the past two to three years designed to handle many of the more complex tasks of setting up electronic-commerce sites.

Client/Server Labs looked at three such products identified by industry analysts as representative of the market. We found that, though establishing a commercial site still isn't an instantaneous process, it no longer requires an immense and extremely inventive staff of programmers.

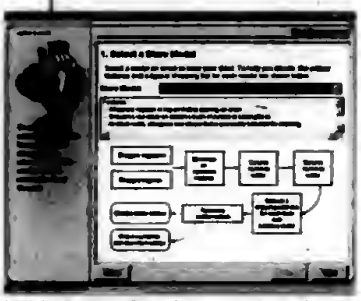
Making that site an interconnected part of your business may be another matter. We found that tying a site to order-fulfillment and customer service processes, payment processing services or legacy systems still requires significant custom development, the purchase of a third-party add-in, the implementation of a very high-end product or a combination of the three.

For smaller firms interested in an elementary site with little or no customization, less-expensive packages such as Microsoft Corp. Site Server or IBM Net.Commerce, provide good out-of-the-box capability. But those who need to tailor a site must compare the long-term costs of custom development using the IBM and Microsoft class of products with the higher up-front costs of offerings such as those from Open Market, Inc.

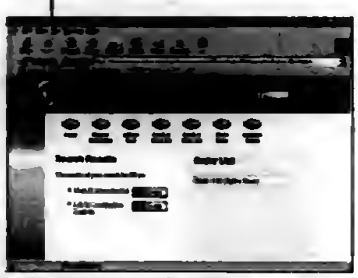
Included in our tests were IBM Net.Commerce Pro, Microsoft Site Server Commerce Edition, and Open Market's Transact and Live Commerce. Netscape Communications Corp. declined to submit its E-Commerce Expert series of software.

SETTING UP SHOP

We installed each product on a Dell Computer Corp. 2300 server and established an Internet storefront for an imaginary firm, MetaLuna, Inc., dealing in specialized electronic equipment. We set up a catalog, created a Web interface through which customers could view and order from the catalog, and then interacted with each site as if we were consumers.



Net.Commerce Pro offers a variety of store models to choose from



Net.Commerce Pro features virtual mall capabilities but clumsy tools

NET.COMMERCE PRO

Like the Microsoft product, Net.Commerce Pro is both an application allowing rapid deployment of a simple site and a tool kit intended for customized development of larger, more tailored sites. As an integrated system, Net.Commerce Pro seemed to take a bit more effort than we anticipated. Although setting up a storefront wasn't particularly difficult, the administration tools weren't as robust as we would have liked.

The Net.Commerce Pro package included a single CD containing the Net.Commerce software, Domino Go Web Server, DB2 Universal Database 5.0 and Netscape Navigator 4.04. The Net.Commerce Pro software optionally supports the Domino Web Server, or the Netscape Enterprise Server, as well as open database connectivity (OOBC) connections to an Oracle database.

The installation process seemed quite simple but failed the first time through when the install program loaded the operating files for the Domino Go Web Server into the wrong directory. Reinstalling the Web server, as suggested in a readme file we found by searching the disc, didn't solve the problem. After de-installing, the entire product reinstalled successfully, though we were unable to discern any difference between the two installation processes. Once installed, the product operated fairly well.

Our testers' only serious complaints were about screen arrangements. All management is handled through the Web interface, but our testers found a few of the screen layouts unclear on first viewing.

We set up our storefront using the Store Creator function of the administration pages. That nine-step process took about 10 minutes. Setting up our condensed catalog took a bit more doing, however, primarily because of confusion about the relationships among categories, products and items in the database. Completing our entries took about 40 minutes, once we sorted out the problem with the screens.

Each database entry is assigned a reference number, which wasn't shown until we went back and looked up that entry. We needed those numbers to establish associations between products and categories.

Linking images to the catalog also proved to be a bit of a hurdle. The database entry for graphics must be either a complete uniform resource locator or a relative path to a logical directory under the Web server. The definitions for those paths vary depending on the Web server being used, but the administration screens offered no guidance — even for the default Domino Go Web Server.

If a server will be hosting multiple storefronts, Net.Commerce Pro introduces the concept of a "mall." As in the real world, the mall is a collection of stores sharing a common element such as geography, expected clientele or type of business. Like a storefront, the mall is established using the Site Manager and Store Manager functions of the Administrator pages.

Net.Commerce Pro includes several command-line utility programs that perform such tasks as mass product and category imports and cleaning outdated information from the database. For customizing sites, the online documentation includes a complete guide to the various HTML query strings understood by Net.Commerce Pro, as well as descriptions of all of the database tables.

IBM also includes instructions on how to connect Net.Commerce Pro to legacy systems such as SAP AG's R/3 or an electronic data interchange system. The instructions are available only through an account with IBM Global Services.

MORE ONLINE

Visit *Computerworld* online for emerging electronic-commerce standards and vendor contact information for leaders in this area.

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gets easier

By Garrett Michael Hayes

MICROSOFT

SITE SERVER COMMERCE EDITION

Microsoft has done a nice job of bundling several previously separate items into a neat package. With the ability to connect to almost any SQL-compliant database and with several interesting sample sites included, the package's extensive set of add-in development tools is almost superfluous for a small site.

That said, Site Server is still more of a tool set, intended to be a development platform upon which large companies may build highly specialized sites requiring a custom development project. A small organization will be able to rapidly field an elementary site but should look carefully at the costs of customization.

The Site Server Commerce Edition package includes the following: Site Server, which was designed to help manage general Web sites; Commerce Server, which enables the selling functions; a Windows NT 4.0 Option Pack to upgrade both the Internet Information Server and Internet Explorer; FrontPage 98, to deploy Web content; and the ubiquitous Visual InterDev for creating advanced content such as ActiveX controls.

Installation took about two hours from start to finish. Excellent online and printed documentation walked us carefully through every step of the process, from installing the prerequisite elements of the NT 4.0 Option Pack, through configuring SQL Server, to starting the process of setting up a store.

An evaluation copy of SQL Server 6.5 is included, but you must purchase a full license separately for a production site. A storefront was created with a pair of applications called the Site Foundation Wizard and Site Builder Wizard. Establishing our storefront took about 20 minutes, with an additional 30 minutes to enter our abbreviated catalog and set up a simple logo and some product images. Beyond using Image Composer to create a small logo, we didn't need to use any of the tools from Visual InterDev or FrontPage98 to put our site into operation.

Because the catalog is stored in a SQL database, you can update the product information either on an individual basis through an administrative Web interface, or in bulk with custom-written SQL applications. We found the Web interface quite easy to follow for both entry and updates.

Commerce Server builds upon several Site Server tools for managing and reporting on a Web site. The Content Analyzer tool maps the content and links of a Web site. Our limited storefront wasn't very intriguing from this viewpoint, but we used the tool to analyze a couple of larger sites and found the information useful. The Personalization & Membership tool creates membership directories and associates them with a Web site. The Membership Directory Manager manages the attributes (such as name, age, interests) associated with members or with Web content. But using the membership services, through which information such as customer preferences is handled, introduces an additional cost in that the user must buy a $49.95 client access license for each registered member or a blanket "Internet connection" license for $2,500.

The various administrative tools are accessible as Web-based applications or as plug-ins to Windows NT's Microsoft Management Console (MMC). However, we found that in many cases (such as in the Store Manager application) the MMC plug-in simply invoked the Web-based tool.

Among the three we used, Ad Server is unique to the Microsoft product. It was designed to help include advertising links into the commerce Web pages presented to consumers. Using the attributes of the Membership Directory, this product inserts advertising tailored to the Web content and the user. For example, a site selling hobby supplies might advertise model-kit promotions on its modeling pages but emphasize ads for vinyl models to a customer who prefers those kits.

Payment processing requires third-party add-ins, and a separate Payment Support CD includes trial versions from six suppliers, plus a link to Microsoft's Web site for the most current list. Here also, a secondary cost for an add-in comes into play for creating a fully enabled site.

E-commerce, page 64

VENDOR: Microsoft
ADDRESS: Redmond, Wash.
PHONE: (425) 882-8080
WEB: www.microsoft.com

PRODUCT: Site Server Commerce Edition

TESTED PLATFORM: NT 4.0 Server

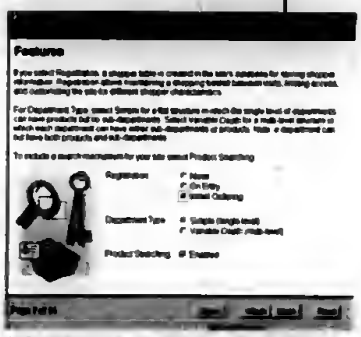
PRICE: $3,495 plus $2,995 for Internet access and/or $49.95 per intranet seat

PROS: Excellent wizard for setting up an initial store; good administrative interface

CON: A slightly overwhelming tool set can be confusing as you decide what you do and don't need

BEST FIT: Medium-size to large companies with moderately complex catalogs

OVERALL IMPRESSION: Very flexible administration, creation and reporting tools make basic site development easy



A Commerce Site Server wizard lets shoppers keep a continuous shopping basket

Microsoft lets you view the stages of how to implement your own store

E-commerce

CONTINUED FROM PAGE 63

OPEN MARKET

VENDOR: Open Market
ADDRESS: Burlington, Mass.
PHONE: (800) 673-6658
WEB: www.openmarket.com

PRODUCT: Transact

TESTED PLATFORM: Solaris 2.5.1

PRICE: $125,000

PROS: Excellent tools for order fulfillment and tracking, plus rich field of built-in payment processing and tax and shipping tools

CONS: Minimal ad hoc reporting tools; major installation project

BEST FIT: Well-suited for very large firms or for commerce service providers

OVERALL IMPRESSION: An industrial-strength engine, Transact requires some serious care and feeding

PRODUCT: Live Commerce

TESTED PLATFORM: NT 4.0 Server

PRICE: $45,000

PRO: Templates have very good default presentation features

CON: Lack of graphic building tools in the current version

BEST FIT: Primarily targeted at vendors with large catalogs

OVERALL IMPRESSION: Self-adapting presentation makes setting up an attractive Web site easy

TRANSACT AND LIVE COMMERCE

An industrial-strength set of tools designed largely for service providers and sizable organizations, the Open Market products require careful planning to field properly. But when installed and configured with a well-thought-out strategy, they help a company take its products to the Internet marketplace in an impressive way.

Open Market's offerings include two major components: Transact, which runs on a Sun Microsystems, Inc. Solaris platform, provides core business functions such as order fulfillment, billing and connections to payment services. Live Commerce, running on a Windows NT Server platform, provides the storage, manipulation and presentation of the product catalog. Either application may be run separately, but that limits the services provided to end users.

Neither product should be installed and set up by an isolated end user. Open Market requires that new customers attend extensive training classes on product configuration and use. It also places consultants on site as advisers for the first week or so of a new implementation — a requirement it applied even to our testing environment.

Installing and configuring Transact on the Sun Ultra 1 platform took about two and a half hours, with almost an hour of that devoted to resolving configuration issues with TCP/IP and domain name server for the servers. In our test environment, Transact was configured to work with Sybase, Inc.'s SQL Server Version 11, although Oracle Corp.'s database could have been used. Web-server functions were handled by a Netscape Enterprise server. Neither the database nor the Web server is provided as part of the Open Market package.

The installation would have been daunting without the Open Market consultants, especially if we had set up Transact on two servers, one inside a firewall and the other outside, as Open Market recommends for actual installations. As Unix installations go, it seemed primitive to our testers, being largely text-based, with little help along the way. Configuration tasks, though, were accomplished through the Web browser interface. Those screens were well-organized and easy to understand, especially compared with the initial installation.

Transact was designed to handle connections for large numbers of Internet storefronts, each of which may be operated by entirely separate companies. Service providers often run Transact as a back end for numerous commercial customers operating individual storefronts. Such connections are the reason Open Market recommends an internal/external split when installing Transact.

Installing Live Commerce, by contrast, was an extremely simple "Install Shield" process that took about 10 minutes. It should be very familiar to anyone who has installed software in the Windows arena. The product then ties in to Microsoft's Internet Information Server.

Configuring a storefront took about an hour and was a little less straightforward, involving some template spreadsheets in which we defined product categories and actual items as well as the links to product images and logos.

Product information in the Live Commerce server is held in a proprietary object database, which may be loaded from either flat files or outside data sources such as ODBC. You also can schedule data loading on a recurring basis. In our test, we used the template spreadsheets to generate flat files, which were then imported.

The storefront we created was fairly impressive — even with our simple catalog. The template included several interesting behaviors. For example, any page that included from two to 10 products would be displayed as a comparative table, whereas single-product pages would show full details, and large numbers of products would be seen as a list.

You can build custom storefronts with a proprietary scripting language, defining screen areas, table spaces, display of controls and the like. The scripts call on a predefined set of JavaScript functions. Scripts may be built from scratch or modeled after the scripts for the included sample sites.

Configuring payment methods was easy, with connections for several popular payment processors embedded into the product. Shipping and tax information was also quite complete, offering built-in lists of all U.S. states and most countries around the world for point-and-click selection.

The ability to do online inquiries into customer status and individual orders was excellent, with views into both the "company" view of information and the information as a customer would see it.

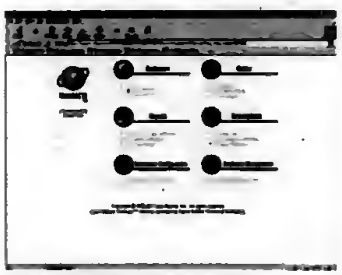
We were slightly disappointed in the reporting capabilities of the Open Market offering, however. Although several batch reports existed, there was no tool available to perform broad ad hoc inquiries.

The richness of the built-in tax and shipping models and the customer service information capabilities goes a long way toward justifying the high cost of the Open Market products, especially when compared with the potential cost of developing custom-tailored applications with other products. They also make the Transact product very attractive for a service bureau, with numerous users of Live Commerce (or other front ends) connecting to a single Transact back-end system. □

Hayes is systems control manager at Client/Server Labs, Inc. in Atlanta, a primary test lab partner of Computerworld.

We categorized products by size using Open Market's product

Open Market's product lets administrators search and sort invoices



Configuring a storefront wasn't a straightforward process

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In Depth

IS MAKEOVER

By Michael Cohn

IS has an image problem, and it's time to do something about it. It's hard to hire people. Jobs go unfilled. Ads go unnoticed. College kids think coding is boring

Face it: People think we're nerds. Young'uns don't want to get into the business. They'd rather be news anchors. Game-show hosts. Special prosecutors.

And what are we doing to combat this perception? We're whining. We're complaining. "No one will work on my ERP implementation." "I can't find people for our year 2000 death march." Shut up, already! Stop moping and do something!

Let's change the image of information systems. Let's make it fun. Trendy. Sexy. We need pizzazz. We need glitz. We need sizzle. Let's start with a few of these ideas:

A slogan. The Army was empty. Then "Be all that you can be" hit the airwaves. Next thing you knew, people were standing in line to climb ropes and crawl around on their bellies.

Then no one was in the Navy. But once people understood that "It's not just a job — it's an adventure," they signed up in droves (even if many probably were just trying to stay out of the Army).

So why don't we have a slogan? Something catchy, like "Real. Comfortable. Assembler." Or maybe, "The few. The proud. The unit testers for midsize financial systems." Hot stuff, eh?

A spokesman. We need someone cool to stick up for IS. Not that Steve Jobs and Ross Perot aren't loaded with charisma, but it's time to appeal to the next generation. How about Leonardo DiCaprio for DBa? Helen Hunt for the help desk? Or even, "I've won two Masters Tournaments and the British Open, but nothing is more satisfying than configuring my own networks."

TV sitcoms. Hand tools were nothing before *Home Improvement*; now they can't keep pliers on the shelves. Also, no one found it even remotely appealing to sit around and drink beer all day, but *Cheers* changed all that.

Maybe the *Cheers* example is a stretch. But nothing changes your image faster than a sitcom. We need one! For example, consider what *Cheers*' Cliff Claven and *Seinfeld*'s Newman have done for the U.S. Postal Service. I hear they're turning away applicants now. Strange thing, since my mail doesn't show up until 7 p.m. as it is.

Theme restaurants. Planet Hollywood. The All-Star Cafe. It's big business! Why not launch trendy restaurants coast to coast with an IS theme? The Hard Drive Cafe would surely pack 'em in. Diskettes for coasters. Program listings for place mats. Bottom line: If you serve chicken fingers, they will come.

Apparel. We're missing the boat on this whole T-shirt thing. They can't keep Chicago Bulls jerseys on the shelves. Green Bay Packers parkas sell like hotcakes. Why not Microsoft? Oracle? Norton Utilities? We're just a couple of garments away from turning our image around — especially if we come up with a 100% cotton pullover that reads: "Just do it . . . but first, write the specs."

Bulk up Gates. If Bill were tan, buffed and weighed 240 pounds, I bet people would dig IS.

Commercials. The 'net is OK, but TV is still king! Look what three frogs did for hops and barley. Let's jump on the amphibian bandwagon. Give me a couple hundred million Super Bowl viewers and 30 seconds of frogs croaking "S - Q - L." It would work, I tell you. Magic. Pure magic. □

Cohn lives in Atlanta, proudly codes Cobol and is thinking about a tattoo.

ILLUSTRATIONS BY DARREN THOMPSON

IT Careers

GREASING THE DEAL

BY STEVE ALEXANDER

SIGN-ON BONUSES *are becoming a matter of course to land just about any IS job candidate. Here's what you should be paying and to whom*

WHEN JUDITH GOODMAN tried to hire a senior network technician to TransAmerica Corp., she knew a little incentive would be required.

The technician hired was earning $85,000 as a consultant but had no benefits or job security. Although TransAmerica offered him a $60,000 salary plus benefits, job security, a stock plan and two weeks of annual training, that still wasn't good enough without a signing bonus of 10%.

"I want people who are high performers," says Goodman, director of technology services at TransAmerica's San Francisco headquarters, "but it's a real shark-infested market out there, and there are some companies who will give a piece of the farm to get those high performers. Cash up front in a signing bonus is a statement: We really want you."

Goodman, who offers signing bonuses to an estimated 35% of new hires, is hardly alone. Information systems managers across the country find that signing bonuses increasingly are being used to recruit scarce IS talent.

At American Century Investments, a mutual fund company in Kansas City, Mo., Jerry Bartlett, senior vice president of human resources, estimates that 20% to 30% of new IS hires get bonuses.

"There are definitely more signing bonuses in IS than there were a year ago," Bartlett says. "I think every big IS shop is offering some signing bonuses for hot skills or senior management."

Mike Natan agrees. "The signing bonus just helps get prospective new hires over any obstacles to coming to work for you," says Natan, chief information officer at Reliance National Insurance Co. in New York and Reliance Insurance Co. in Philadelphia. "If a person you want to hire would be eligible for a bonus by staying at his or her present job for another four months, a signing bonus might compensate the person for losing that money."

Not everyone agrees that more signing bonuses are being handed out, but no one disputes the importance of those that are.

"I don't sense that more signing bonuses are being offered than a year ago, but I do sense that people are becoming more sensitive to them, perhaps because the amounts are larger," says Lynne Halpin, CIO and vice president of information systems at Detroit Edison Co., an electric utility in Detroit. "You have to make your offer particularly attractive if you want people to consider your company."

It appears that IS people below the rank of senior manager can expect signing bonuses in the range of $2,000 to $10,000. Typically, they are paid the full amount when hired, though some companies may require that part of the bonus be returned if the new employee leaves within one or two years. IS managers say they determine how large a bonus to offer by reading consultant studies, talking to other companies and listening when job candidates tell them about other offers they've received.

Who gets sign-on bonuses? First in line are people with hot skills, such as C++, database administration, object-oriented programming, Java, Internet/intranet and systems administration for Unix or Windows NT. Next are experienced IS people. Recent college graduates are third.

Max Johnson uses signing bonuses to hire key experienced people. "At five years or more of IS experience, where we can't match the salary, we give a signing bonus," says Johnson, vice president of human resources at The Principal Financial Group, a diversified group of insurance and financial services companies in Des Moines, Iowa.

Halpin says the use of signing bonuses to recruit college students may be spreading. "Signing bonuses for college students at premier universities has been going on a long time, but it may be moving to the more mainstream universities," she says.

Adds Natan, "A lot of times, college students don't have much money, and a signing bonus of $2,000 to $3,000 can go a long way" toward luring them.

It's not clear whether sign-on bonuses for new hires cause dissension among existing IS employees — a common problem when new hires draw higher salaries than existing workers.

"An existing worker might be able to see that you gave someone a signing bonus because of the cost of changing companies or missing financial opportunities at another company," Halpin says.

Others believe existing workers aren't as aware of signing bonuses as they are of salary differences.

Management seems to like bonuses, in part because they can replace higher salary offers.

"It's a way to hire people without messing up the salary scales. There are enough salary adjustments as it is," Johnson says.

But while signing bonuses may help slow the upward spiral of IS wages, they contribute to another kind of escalating cost: As employee retention programs offer IS workers more deferred incentives to stay put, firms that want to hire them must offer bigger signing bonuses to lure them away.

"We are all stealing IS people from each other," Bartlett says, "and everybody's got a retention plan you must overcome." ❑

Alexander is a freelance writer in Edina, Minn.

WHAT'S IT GONNA COST?

Some IS jobs for which signing bonuses are being paid:

JOB	EXPERIENCE	SALARY	SIGN-ON BONUS
Manager of application development and planning	10 years	$100,000	$10,000 to $15,000
Senior technical developer	5 years	$75,000	$6,000 to $7,500
Business systems analyst	5 years	$75,000	$6,000 to $7,500
Web programmer	Open	$65,000	$2,000

*These figures represent average sign-on bonus amounts, as reported by sources contacted for this report. None of these bonuses carried any restrictions.

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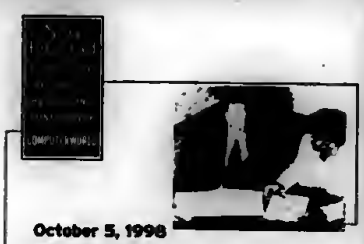

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Career Counselor

ADVICE FOR THE IT PROFESSIONAL

Lulled by dreams of money and career control, many IS professionals are tempted by the twin sirens of contracting and consulting. But it's definitely an acquired lifestyle and not for everyone

TO BE A CONTRACTOR OR NOT TO BE?

Have you got what it takes?

BY LINA FAFARD

In the ever-changing information systems environment, there will always be a need for contract programming services. These technology mavericks need the ability to quickly understand the assignment, the technical skills necessary to deliver results and minimal supervision. They also must be self-motivated and not let their egos get in the way of an assignment. They are hired to follow the plan — and to deliver results quickly.

The pros and cons of contracting

THE GOOD

- You get paid for the hours you work and can set your own hours.
- You often don't have to attend staff meetings and planning sessions.
- You don't have to grapple with company politics.
- You can work on one assignment at a time and not be pulled from one critical project to the next.
- The money is often much better.
- You can continue to increase your income while remaining technical, without the pressure of having to go into management to get raises.
- Less stress. You won't have the same attachment to the project as an employee does.

THE BAD

- You will spend a lot of time doing research and learning on your own time.
- There is a lack of recognition for your contributions.
- You are responsible for covering the cost of benefits such as health insurance.
- You face the potential of layoffs (contractors usually are the first to go).
- You may need to travel and/or commute more than desired.
- If you want or need to get back into full-time work after contracting, it may be a tough sell in a tighter market.

What to expect

Here's the inside scoop from working contractors we contacted:

How do you gain experience in the hottest technical areas, such as PeopleSoft and SAP, to get the high-paying contracts?

One way is to first gain experience as a full-time employee. Then you can usually get in on a good contract, based on whom you know.

For example, if you work on a DB2 Cobol part of a PeopleSoft package, it's simply a matter of learning more about the rest of the product on your own.

Do you feel intimidated by not being extremely knowledgeable about the product you're hired to install or support?

No. Several contract and consulting companies are training college graduates, then putting them on assignment with one lead person. Many contractors are pretty green; however, they have a strong network of resource support and can go to their lead teammate on the job for help. If you don't have that network, just do the research on your own.

Is it lonely?

It can be. Sometimes you don't make friends on an assignment. On others, several of the contractors go to lunch together, play volleyball after work and become good friends.

How do you feel about the volatility of contracting?

One company laid off an entire team of full-time employees to keep its contractors on site. It did that because it would have been more costly to retrain the employees. At that point, the concept of secure, full-time employment went out the window.

Characteristics of success

A successful contractor must be flexible, driven, able to follow directions well and able to complete a given assignment. It's a good idea to have a good financial plan in place for "time on the beach" (i.e., when you're out of work or between projects). For example, one contractor spent 11 weeks declining undesirable contracts — then accepted an assignment 80 miles from home.

With current contracting rates as high as $115 to $150 per hour (not including markup charges), the situation can't last. Some day, customers may hold software vendors such as PeopleSoft responsible for providing more turnkey customization of their products. However, we're a long way from that day, and contracts for consultants will be bountiful for the foreseeable future.

The risks and rewards of contracting in an IS organization are high. It's not easy, and it's certainly not for everyone.□

Fafard is the branch manager of Montgomery West, a retained-executive search firm in Torrance, Calif. She can be contacted at LinaFafard @aol.com.

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Programmer/Analyst. Analyze, design, program user friendly interfaces for analytical information systems using C/C++ languages and "intellectual front ends" using LPA Prolog. Use "inverted file" technique to develop information retrieval systems dealing with large data bases. Bachelor's degree in Computer Science, Physics or Math/Applied Mathematics plus 2 years experience in job offered or as Software Engineer or Designer or Systems Analyst required. Previous experience and/or education must include use of inverted file technique, LPA Prolog, C/C++ languages, and the design/programming of interfaces for analytical information systems. 40 hrs/wk, 8am-5pm, $46,400/yr. Must have proof of legal authority to work permanently in the U.S. Send two copies of both resume and cover letter to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, IL 60605, Attention: Leonard Box, Reference #V-IL 19153-B. NO CALLS. An Employer Paid Ad.

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REGIONAL SCOPE

The Pacific Northwest

VICTIMS OF THE VENDORS

By Fawn Fitter

IT salaries in the Pacific Northwest are rising faster than anywhere else. IT users have to pay dearly to compete with Microsoft and friends

IN THE PAST three years, Rob Hassell has been forced to hire 30 IT workers from a source he's rarely used: college campuses.

As general manager of MIS at Freightliner Corp., America's largest manufacturer of big trucks, Hassell simply can't find enough desirable IT talent in the local market. He says that's forcing him to hire at entry level and to invest more in training and mentoring than he really has time for.

Ten years ago, the Portland, Ore.-based company would never have hired inexperienced employees, Hassell says. But today, especially in application development, "It's hard to find experienced people at the prices we're willing to pay," he says.

Welcome to Microsoft country, where information technology user companies have a tough time competing against vendors that can offer higher salaries and stock options to lure new talent.

A salary survey last year revealed that the average employee in the computer services industry in the Puget Sound area earns an astonishing $164,000 per year — although stock options account for a good part of that sum.

And with unemployment in the Pacific Northwest at a 30-year low, wages are rising in the region faster than in any other part of the country — staying far ahead of inflation, according to the Washington State Employment Security Department.

Sure, you've heard it before, but there's really only one word to describe the information systems job market in this region: sizzling. With thousands of high-tech startups, a wealth of venture capital and IS-hungry employers in industries ranging from banking and health care to manufacturing and education, there's no indication the area will cool off any time soon.

IT SALARIES IN THE PACIFIC NORTHWEST

JOB TITLE	TOTAL COMPENSATION*
Chief information officer	$117,000
Director of IS/MIS	$76,000
Database manager	$56,000
Senior programmer/analyst	$54,000
LAN manager	$48,000
Computer operations manager	$47,000
Programmer/analyst	$43,000
Network administrator/analyst	$41,000
PC technical support specialist	$33,000
Computer operator	$27,000

*Based on base salary plus bonuses

Source: *Computerworld*'s 1998 Annual Salary Survey, to be published next month

Paul Freed, president and CEO of Northwest Search, a Seattle-based IS recruiting firm, sums up the atmosphere succinctly: "If you have a pulse and any desire to work, you're employed."

The hiring landscape has changed considerably as a result, Freightliner's Hassell says. With 250 IT people on staff and about 100 contractors, Freightliner has one of Portland's largest IS departments. "The job market here is very good for IT professionals right now and very difficult for employers," he says. Even though the company is hiring much closer to entry level than ever before, Freightliner has increased its starting salaries substantially in the past couple of years.

There's no single hot industry for IT professionals. Hiring managers say everyone has openings. But the most pressing need may be in academia, which can't afford to keep up with the skyrocketing wages being offered by the private sector. And when it comes to recruiting in the shadow of Redmond, Wash.-based Microsoft Corp., it's tough for everyone — user company and vendor alike.

"We need world-class Internet architects to develop the next generation of Internet technologies — and we've been looking for them for more than a year," says Ron Johnson, vice president of computing and communications at the University of Washington. "Every time we get close to hiring someone, they decide to go to work for Microsoft at three or four times what we can pay."

The university's highly advanced infrastructure is critical to its educational and research operations, Johnson says. As a result, the skills needed by his IS employees are so far advanced that the department competes for a tiny pool of people in the local market.

Hiring managers say they especially need employees experienced in client/server systems, Visual Basic and C++ programming and network computing, particularly on Internet-related networks. World Wide Web commerce transaction processing is also hot. And, as in the rest of the country, everyone wants Cobol programmers for their year 2000 projects.

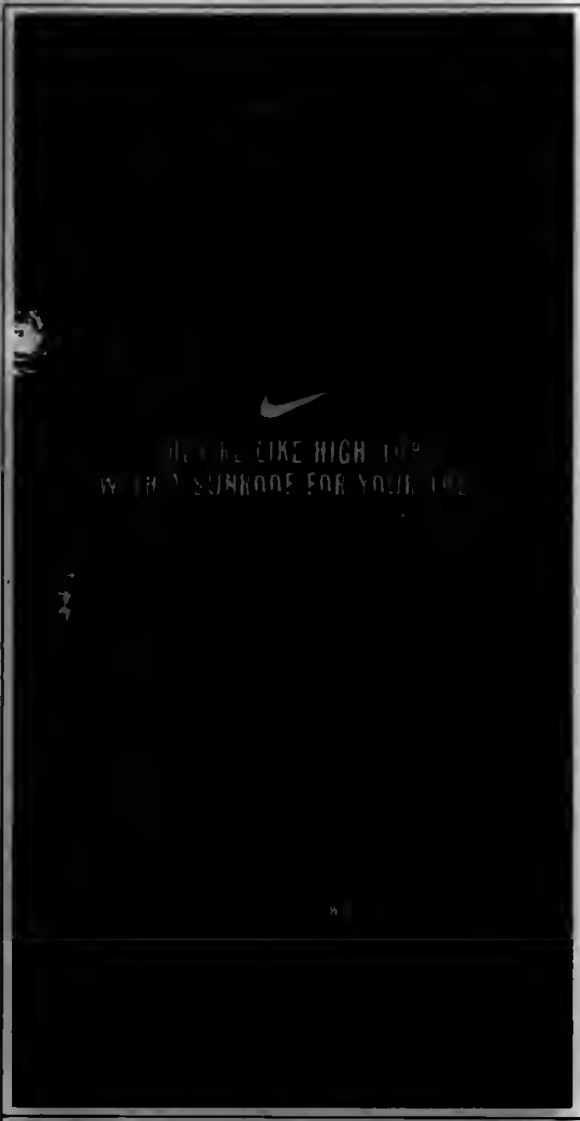
The shortage of qualified Cobol programmers has proved a problem for Seattle-based Airborne Express Co., which needs them to run its mainframe systems, not for year 2000 programming.

"We currently have 28 open positions in IS, and 15 of those are for mainframe Cobol people," says John Kirchgessner, director of IT systems recruiting. Airborne recently filled several openings in its 400-person IS department, hiring Unix system administrators, distributed systems analysts supporting Novell NetWare and applications architects. It also hired a capacity planning analyst after a year-long search.

Those living in the region say the job market is only one reason to love the Pacific Northwest. They also sing the praises of its scenery, low crime rate, relatively low cost of living and its outdoorsy lifestyle (when they have time to enjoy it).

Seattle in particular has developed an aura of laid-back success that's hard to resist, with more theaters per capita than any city besides New York, an expanding civic center and plenty of cultural activities for days when the rain keeps people indoors. And, of course, the area trails only California's Silicon Valley and Massachusetts' Route 128 as a center of technological innovation. □

Fitter is a freelance writer in Boston, Mass.



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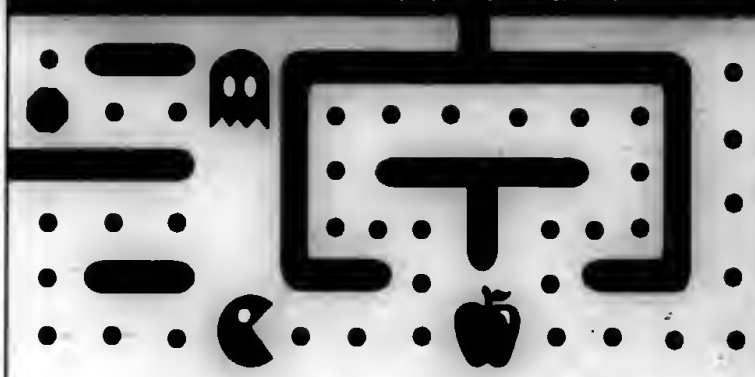

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The Computerworld Chicago Area Corporate Technical Recruiting Conference!

Monday, August 31, 1998

Hyatt Regency Chicago, Chicago, Illinois

On August 31, 1998, you have a special opportunity to update your recruiting skills and network with recruiters in your area at the second annual Chicago Area Corporate Technical Recruiting Conference, held at the Hyatt Regency Chicago, Chicago, Illinois.

A Full Schedule of Contemporary Topics

7:45am **Continental Breakfast & Conference Registration**

8:30am **Concurrent Sessions:**
- **Building an Internet Recruitment Strategy** *Tracey Claybrooke, Claybrooke & Associates*
- **Attracting, Retaining and Engaging IT Talent** *Jackie Cudahy & Len Tenner, Hewitt Associates*
- **High Tech/High Touch: Creating the Recruiting Office of the Future** *Sue Keever, The Keever Group*

10:00am **Sponsor Showcase/Coffee Break**

10:30am **General Session:** **Recruiting - Into the Next Millennium** *Gary Cluff, President, Cluff & Associates*

12:00pm **Luncheon Keynote:** **Joe Maglitta, Industry Editor, Computerworld**

1:30pm **Town Hall Forum** *Mark Jeske, Moderator, May & Speh*

3:00pm **Sponsor Showcase/Coffee Break**

3:30pm **Concurrent Sessions repeat:**
- **Building an Internet Recruitment Strategy** *Tracey Claybrooke, Claybrooke & Associates*
- **Attracting, Retaining and Engaging IT Talent** *Jackie Cudahy & Len Tenner, Hewitt Associates*
- **High Tech/High Touch: Creating the Recruiting Office of the Future** *Sue Keever, The Keever Group*

5:00pm **Program ends**

Selected Sessions Include:

Luncheon/Keynote Address
Joe Maglitta
Industry Editor, Computerworld

Joe Maglitta, one of the industry's leading watchers of the Information Systems profession, will give you an up-to-the-minute view in this very special keynote address.

Building an Internet Recruitment Strategy
Tracey Claybrooke
President, Claybrooke & Associates, Inc.

As mass advertising reaches a consumer by television, radio, billboards, print media in various locations and venues - this same marketing/prospecting effort can take place on the internet to maximize your recruitment efforts. Learn about this and more in this session.

Recruiting - Into the Next Millennium
Gary Cluff
President, Cluff & Associates

The rapidly growing economy and the baby bust have combined to create today's highly competitive technical recruiting market. Will it be survival of the fastest, or the richest, in the years ahead? This look at the demographics, recruiting trends, reengineering efforts and emerging practices in the employment industry may help to identify what we can expect as we rush into the new millennium.

Town Hall Forum
Mark Jeske
Recruiting Manager, May & Speh

In this session, you'll not only be able to propose your specific questions for open discussion, you'll learn of real world issues and solutions from your peers. You won't want to miss this rare opportunity as Mark Jeske, an expert in the HR field, leads us through this modern discussion of your recruiting topics.

For more information, call the conference hotline: 1-800-488-9204

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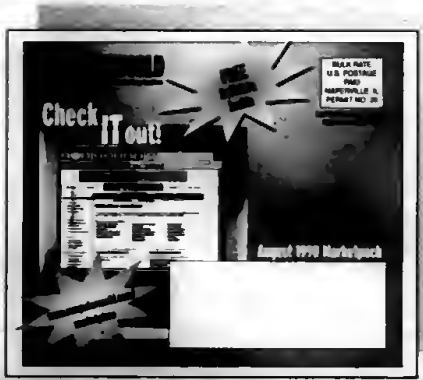

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The Week in Stocks

Gainers / Losers

PERCENT

Gainers		Losers	
Stratus Computer Inc.	31.7	Egghead Discount Software	-30.4
Micron Technology	21.3	Shiva Corp. (L)	-24.0
American Power Conversion	13.2	Centura Software	-22.6
QMS Inc.	10.0	NetManage Inc. (L)	-20.7
Sequent Computer Sys. (L)	9.7	Information Resources	-17.2
IBM (H)	9.3	Concentric Network Corp.	-17.0
Advanced Micro Devices	9.3	Emulex Corp.	-16.7
Oracle Corp.	9.1	Komag Inc. (L)	-16.3

DOLLAR

Gainers		Losers	
IBM (H)	11.63	Shared Medical Systems	-10.69
Stratus Computer Inc.	6.94	Lycos Inc.	-9.50
Dell Computer Corp.	6.38	Amazon.com	-9.41
Micron Technology	5.69	Intuit Inc.	-7.94
American Power Conversion	2.81	Ascend Communications	-7.56
Computer Sciences	3.31	Egghead Discount Software	-6.31
Intel Corp.	3.19	Computer Associates (L)	-5.94
Texas Instruments	3.13	Concentric Network Corp.	-5.13

INDUSTRY ALMANAC

C-Cube: Favorable buzz

Awarded an Emmy three years ago for its MPEG-2 technology contribution to digital television, C-Cube Microsystems, Inc. (Nasdaq:CUBE) now gets accolades from Wall Street analysts.

C-Cube, in Milpitas, Calif., specializes in video compression technology. It's a player in a niche market of companies that develop systems and chips for digital video and communications applications.

Competitors include Ess Technology, Inc. and Sony Electronics. And while C-Cube is a leader in video compression, these rivals offer broader product lines, says Elias Moosa of BankAmerica Robertson Stephens in San Francisco.

Market analysts say C-Cube's 1996 acquisition of DiviCom, its systems integration division, has helped its bottom line. And in China, C-Cube is on the leading edge of the VideoCD trend, a digital video standard.

C-Cube's revenue for the second quarter rose to $82.5 million from $71.1 million for the same period last year. Earnings per share were 28 cents, up from 21 cents per share, and 5 cents better than analysts' predictions, according to "The California Technology Stock Letter." That newsletter predicts analysts' estimates for the firm's earnings will rise over the next few quarters.

Drake & Co., a New York research firm, has a Buy rating on C-Cube and holds a favorable outlook on the stock for the long-term. "A lot will depend on how the cable and digital video TV market shapes up in the U.S.," said Steven M. Frenkel, a market researcher at Drake.

— Roberta Fusaro

C-CUBE READY TO RISE

Analysts are watching to see how digital TV will play in the U.S. market

Exch	52-Week	Range		July 31 2pm	Wk Net Change	Wk Pct Change
[illegible]						**[illegible]**
COMS	57.56	22.83	3COM Corp	24.83	-2.31	8.6
AIT	52.13	36.13	AMERITECH Corp (H)	44.83	2.13	4.2
ASND	58.75	22.00	Ascend Communications	45.00	7.56	14.6
T	68.50	36.19	AT&T	61.19	2.00	3.4
BNYN	11.38	1.75	Banyan Systems Inc	7.00	-0.88	5.1
BAY	44.00	21.38	Bay Networks Inc	34.50	0.19	0.5
BEL	37.00	56.38	Bell Atlantic Corp	45.94	0.44	1.0
BLS	75.63	40.31	BellSouth Corp (H)	80.19	0.56	-0.8
BRKT	22.75	9.56	Brooktrout Technology	14.81	1.00	11.2
CS	56.56	11.44	Cabletron Systems	11.88	0.75	5.6
CGRM	31.88	8.38	Centigram Communications	11.13	0.13	1.1
CSCO	103.56	45.50	Cisco Systems Inc	97.44	0.35	-0.3
CMNT	6.50	3.56	Computer Network Tech	5.94	0.44	6.3
CNCX	61.00	7.88	Concentric Network Corp	25.00	5.13	17.0
DIGI	19.56	16.50	DSC Communications	11.06	3.25	4.8
FORE	56.00	13.25	FORE Systems Inc	24.75	1.38	6.3
GDC	8.18	5.25	General DataComm Inds	1.01	0.44	56.3
GSX	80.44	35.56	General Signal Networks	80.38	1.75	4.2
GTE	64.56	40.56	GTE Corp	54.44	1.13	5.4
LU	100.50	56.16	Lucent Tech	94.88	2.06	2.1
MADGF	5.14	3.21	Madge Networks NV	4.00	0.25	5.9
MCIC	69.83	27.31	MCI Communications Corp	65.69	1.58	3.1
NETM	3.28	2.00	NetManage Inc (L)	2.03	-0.53	20.1
NTRX	1.50	0.67	Netrix Corp	2.68	0.13	4.5
NCDI	11.75	5.88	Network Computing Devices	7.88	0.00	0.0
NWK	22.56	11.63	Network Equipment Tech	13.56	-0.19	2.5
NN	56.38	56.94	Newbridge Networks Corp	27.19	-0.56	2.6
NT	56.25	39.66	Northern Telecom Ltd	59.19	0.56	1.0
NOVL	11.63	6.81	Novell Inc	11.44	-0.81	-6.6
ODSI	19.50	3.19	Optical Data Systems Inc	6.11	0.13	2.1
PCTL	11.50	5.63	PictureTel Corp	8.44	-0.38	-4.1
OPEN	3.88	0.87	Proteon Inc	1.22	0.03	-2.3
RACO	4.13	1.00	Racotek Inc	2.00	-0.08	2.3
RADS	29.56	6.56	Radiant Systems Inc	7.13	0.00	-8.8
VRTL	11.83	2.40	Retix (L)	2.88	0.63	2.4
SBC	46.56	26.75	SBC Communications	41.13	1.44	3.6
SFA	37.94	14.00	Scientific Atlanta Inc	29.81	0.81	1.3
SHVA	16.44	5.75	Shiva Corp (L)	6.13	1.03	24.0
FON	73.83	38.25	Sprint Corp	56.38	3.75	5.1
QWST	47.00	14.44	Qwest Communications Int	61.44	-0.63	1.3
SMSC	13.13	7.88	Standard Microsystems Corp (L)	8.75	0.16	6.9
USW	58.00	15.88	US West Inc	53.69	0.58	0.7
XIRC	21.31	8.63	Xircom	21.00	1.56	7.7
XYLN	51.83	13.50	Xylan Corp	24.56	0.16	0.0
PCs and Workstations						**UP [illegible]**
AAPL	56.13	13.15	Apple Computer Inc	55.00	0.08	1.4
CPQ	50.75	23.13	Compaq Computer Corp	33.13	2.61	8.6
DELL	178.25	35.00	Dell Computer Corp	111.56	6.56	6.1
GTW	80.75	25.08	Gateway 2000 Inc	54.25	1.56	2.8
HWP	82.94	55.44	Hewlett Packard Co	56.81	-0.08	1.2
MUEI	21.00	8.44	Micron International Inc	14.00	0.44	3.2
NIPNY	13.75	61.83	NEC America	98.25	1.38	2.8
SGI	30.31	10.94	Silicon Graphics	11.31	0.00	0.0
SUNW	53.31	30.00	Sun Microsystems Inc	48.50	0.18	0.6
Large Systems						**UP 4.2%**
DGN	37.94	12.88	Data General Corp (L)	13.31	0.00	0.0
IBM	156.00	80.38	IBM (H)	136.00	11.63	9.3
MDCD	6.63	1.13	[illegible] Data Inc	1.75	0.00	0.0
NCR	56.00	25.63	NCR Corp	33.00	0.50	1.0
PRCM	18.63	5.00	ProCom Technology, Inc (L)	5.44	-0.50	-8.4
SQNT	31.25	9.56	Sequent Computer Sys. (L)	11.50	1.00	9.7
TEXM	6.00	2.75	Texas Micro Inc	1.61	0.00	0.0
SRA	30.75	21.44	Stratus Computer Inc	28.81	6.94	31.7
UIS	50.00	8.81	Unisys Corp	27.25	-0.75	-2.3
Software						**OFF [illegible]**
ADBE	53.13	30.31	Adobe Systems Inc	38.81	-4.44	-11.0
AMSWA	13.83	5.75	American Software Inc (L)	5.13	-0.63	8.0
APLX	12.56	3.38	Applix Inc (L)	3.56	-0.25	-6.6
ARSW	37.25	27.16	Arbor Software	25.88	3.38	13.0
ARDT	13.88	6.83	Ardent Software	13.56	-0.94	-6.5
ARSC	56.38	19.25	Aris Corp	27.56	0.88	3.3
ADSK	51.13	30.44	Autodesk Inc	32.88	1.16	3.7
BMCS	48.50	27.56	BMC Software Inc	40.00	1.08	0.3
BOOL	26.00	16.88	Boole and Babbage	23.88	-0.18	-0.8
BOBJY	40.00	6.63	Business Objects	10.69	2.08	15.5
CAYN	3.50	0.63	Cayenne Software Inc	0.81	0.08	8.3
CNTO	3.31	0.88	Centura Software	1.56	-0.38	-22.6
CHKPF	38.56	22.88	CheckPoint Software	24.28	-0.88	-2.6
COGNF	34.75	17.38	Cognos Inc	25.00	-0.71	1.3
CA	61.83	33.44	Computer Associates (L)	33.44	-5.90	-15.1
CPWR	60.13	28.75	Compuware Corp	55.88	-0.73	1.3
CSRE	11.13	6.25	Comshare Inc	5.00	-0.75	13.0
COSFF	6.64	1.00	Corel Corp	1.50	0.00	0.0
DWTI	5.38	2.13	Dataware Technologies Inc	3.00	0.00	0.0
DCTM	50.63	[illegible]	Documentum Inc	41.50	1.00	4.2
FILE	32.00	7.56	FileNet Corp	25.75	1.13	4.2
FRTE	16.56	2.00	Forte Software	5.19	-0.88	-9.8
FTPS	4.63	1.18	FTP Software Inc (L)	1.19	0.13	-8.5
GPSI	40.00	20.38	Great Plains Software, Inc	38.50	2.50	-7.1
HUMCF	56.25	22.06	Hummingbird Comm Ltd (L)	22.44	1.31	5.5
HYSW	44.63	25.50	Hyperion Software Corp	27.56	3.56	-11.4
IRIC	38.00	12.50	Information Resources	14.75	3.00	17.2
INFM	11.25	4.00	Informix Corp	6.53	-0.47	-6.7
INPR	13.16	0.00	Inprise Corp	4.60	-0.53	7.6
INGR	16.19	6.40	Intergraph Corp (L)	8.83	0.08	0.9
LEAF	4.90	1.22	Interleaf Inc	1.83	0.00	4.0
ISLI	21.25	11.25	Intersolv Inc	17.00	-0.63	3.5
INTU	67.94	29.83	Intuit Inc	32.13	7.83	-13.2
JDEC	48.25	24.00	J.D. Edwards Co	40.69	2.31	5.6
TLC	32.83	10.38	Learning Co (The)	27.56	-2.08	-6.9
MANU	56.38	20.50	Manugistics Group Inc	22.50	1.38	-13.0
MAPS	14.25	8.38	MapInfo Corp	12.63	0.88	4.1
MATH	4.63	2.38	MathSoft	3.25	0.00	3.0
MENT	13.13	6.13	Mentor Graphics	10.00	0.19	3.8
MIFGY	60.63	26.13	Micro Focus	37.00	1.00	-2.0
MCXI	16.88	5.75	Micrografx Inc	11.75	-0.08	-0.6
MSFT	119.63	59.88	Microsoft Corp	112.25	1.94	1.7
OBJS	6.25	0.44	ObjectShare, Inc	2.19	-0.15	5.4
OMTL	15.00	4.13	Omtool Ltd	4.75	-0.75	13.0
ORCL	42.13	17.25	Oracle Corp	20.88	2.25	9.1
PMTC	86.31	12.88	Parametric Technology	13.75	0.00	0.0
PSFT	23.44	00.00	PeopleSoft	37.88	3.25	4.0
PTEC	18.38	4.88	Phoenix Technologies	11.63	0.06	0.5
PSQL	27.25	7.63	Platinum Software	21.13	3.13	12.3
PLAT	34.31	16.63	Platinum Technology	31.88	0.88	2.8
PRGS	28.13	10.75	Progress Software Corp	22.00	-2.31	-9.5
RNBO	00.13	11.75	Rainbow Technologies Inc	16.13	0.81	5.2
REDB	11.63	2.00	Red Brick Systems Inc (L)	2.50	-0.08	-2.4
ROSS	5.00	2.00	Ross Systems, Inc	4.56	-0.22	0.0
SCOC	7.25	2.83	SCO Inc (L)	3.25	-0.10	5.5
SDTI	43.25	13.66	Security Dynamics Tech (L)	13.50	1.00	10.0
SSW	32.81	13.00	Sterling Software Inc	27.00	1.94	6.7
SDRC	56.00	13.56	Struct Dynamics Research	13.38	-0.25	1.0
SYBS	21.38	0.11	Sybase Inc	8.94	0.00	0.0
SYMC	32.63	17.00	Symantec Corp	24.50	2.25	8.4
SNPS	47.13	25.13	SynOpsys	38.13	9.00	6.0
SSAX	17.63	5.00	System Software Assoc (L)	5.56	-0.50	8.1
SYSF	14.13	1.00	Systemsoft Corp	7.16	8.00	7.3
BAANF	32.50	08.56	The Baan Co	40.11	1.38	4.1
TRUV	5.16	0.75	Truevision Corp	1.19	0.16	11.6
VIAS	65.25	11.75	Viasoft Inc (L)	12.88	-0.44	3.3
VSIO	80.88	26.56	Visio Corp	37.59	2.53	6.1
WALK	20.44	6.81	Walker Interactive Systems (L)	10.81	-0.94	8.0
WALL	21.88	10.13	Wall Data Inc	14.00	0.50	3.7
WANG	32.35	18.61	Wang Laboratories Inc	22.63	-0.75	1.2
Internet						**[illegible]**
AMZN	147.00	11.83	Amazon.com	112.09	-8.41	7.7
AOL	140.50	31.61	America On Line	113.19	1.44	1.2
ATHM	57.25	18.00	At Home Corp	41.00	-4.00	8.5
EDFY	23.11	7.38	Edify Corp (L)	7.38	0.75	9.0
XCIT	55.50	7.11	Excite Inc	19.25	-4.63	10.5
SEER	65.00	4.56	Infoseek Corp	25.50	3.73	13.0
LCOS	107.25	16.25	Lycos Inc	57.75	8.50	14.1
NSCP	44.33	14.88	Netscape Comm Corp	29.94	1.94	-6.1
NSOL	89.00	11.75	Network Solution Inc	37.88	2.81	8.0
OMKT	24.13	8.00	Open Market Inc	16.38	0.13	0.8
SECS	31.00	12.00	Pegasus Systems	22.81	-2.81	11.3
PSIX	31.44	4.25	PSINet (H)	17.88	2.06	10.4
QDEK	1.50	0.53	Quarterdeck Corp	0.44	0.00	0.0
SCUR	13.25	3.50	Secure Computing Corp	12.75	0.50	4.1
SPYG	15.58	4.00	Spyglass Inc	11.31	1.00	8.6
YHOO	207.50	32.16	Yahoo! Inc	180.50	1.80	1.0
Semiconductors						**UP [illegible]**
AMD	42.75	15.18	Advanced Micro Devices	17.88	1.50	9.3
ADI	39.63	21.44	Analog Devices Inc (L)	22.00	-0.31	1.4
CRUS	17.75	8.81	Cirrus Logic	8.81	-0.47	-5.1
CY	18.94	7.08	Cypress Semiconductor Corp (L)	7.56	0.00	0.0
INTC	102.00	65.00	Intel Corp	85.56	3.16	5.0
LSCC	74.56	25.63	Lattice Semiconductor	30.75	1.13	3.9
LSI	35.81	18.63	LSI Logic Corp	21.31	0.75	3.0
MCRL	46.00	31.50	Micrel Semiconductor Inc	50.94	-0.78	-2.5
MU	60.00	30.00	Micron Technology	32.38	5.56	21.3
MOT	63.94	40.56	Motorola Inc	53.00	2.25	4.4
NSM	42.88	12.31	National Semiconductor	12.88	-0.31	2.6
RMBS	80.75	41.50	Rambus Inc	50.00	5.00	5.6
TXN	71.25	55.63	Texas Instruments	60.81	3.13	5.4
VLSI	30.88	14.56	VLSI Technology	16.19	-0.94	-5.5
XLNX	57.13	28.00	Xilinx	38.13	1.00	0.3
Peripherals and Subsystems						**OFF [illegible]**
ADPT	54.25	10.50	Adaptec Inc. (L)	12.06	0.94	8.5
APCC	34.38	22.13	American Power Conversion	32.69	3.81	13.2
ANDA	2.81	1.00	Andataco Inc	1.00	-0.19	15.0
CREAF	29.38	11.00	Creative Technology Ltd	12.38	0.88	7.8
RACE	10.58	0.50	Data Race Inc	3.16	0.07	1.3
DPM	11.88	7.88	Dataram Corp	12.13	-0.25	-2.0
EMC	38.19	23.56	EMC Corp	49.94	1.13	2.3
EMLX	18.75	3.31	Emulex Corp	8.13	1.63	10.7
ESCC	73.88	31.44	Evans and Sutherland	25.19	-0.56	-2.2
EXBT	12.75	5.63	Exabyte	6.31	-0.75	-2.9
IISFD	4.50	0.94	Intelligent Info Systems (L)	1.00	0.00	0.0
IOM	16.75	4.75	Iomega Corp	5.31	-0.28	5.0
KMAG	29.25	2.75	Komag Inc (L)	3.38	-0.56	16.3
MTSI	14.00	13.00	Micro Touch Systems Inc	15.75	1.63	8.4
MTIC	11.88	5.81	MTI Technology Corp	7.38	-0.88	-4.8
AQM	21.00	2.21	QMS Inc	4.13	0.38	10.0
QNTM	43.25	16.00	Quantum Corp (L)	17.13	1.56	7.2
RDUS	8.13	1.88	Radius Inc (L)	2.00	-0.38	-15.8
SEG	50.50	17.75	Seagate Technology	22.63	-0.38	2.9
SDS	14.00	3.00	Storage Computer Corp (L)	2.35	0.12	6.0
STK	51.13	33.31	Storage Technology	38.25	1.00	4.7
[illegible]	80.16	27.63	[illegible] Inc (L)	37.63	2.25	7.5
WDC	54.75	10.25	Western Digital Corp	11.31	-0.10	1.0
XRX	110.50	56.19	Xerox Corp	108.00	3.00	-0.6
Services						**OFF [illegible]**
AMSY	33.50	17.63	American Mgmt Systems	60.44	0.19	0.6
ANLY	56.38	22.69	Analysts Int'l	24.00	2.00	3.7
AUD	75.56	26.58	Auto Data Processing	67.56	-2.88	-4.1
CATP	69.38	31.00	Cambridge Tech Partners	43.50	-2.00	-6.2
CEN	44.00	32.13	Ceridian Corp	57.25	1.38	2.3
CDO	23.25	13.44	Comdisco Inc	15.81	0.19	-7.0
CPU	56.00	16.50	CompUSA Inc	13.00	-0.31	5.9
CHRZ	53.50	25.75	Computer Horizons	33.13	-2.81	7.6
CSC	38.00	33.63	Computer Sciences	65.00	3.31	3.4
TSK	49.38	17.00	Computer Task Group	32.63	1.00	3.1
EGGS	29.13	4.88	Egghead Discount Software	14.44	-6.31	30.4
EDS	50.88	35.56	Electronic Data Systems Corp	35.94	0.13	0.4
IOO	39.63	22.63	Inacom Corp	28.25	-2.31	-7.6
KEA	60.63	24.00	Keane Inc	54.63	1.13	2.1
MICA	29.75	10.06	MicroAge Inc	14.06	-0.94	-6.3
PAYX	45.00	21.69	Paychex	43.13	0.50	0.9
PMS	44.63	25.69	Policy Management Systems	44.31	2.63	6.3
REY	34.00	16.44	Reynolds and Reynolds	17.06	-0.50	3.2
SAPE	52.00	23.88	Sapient Corp	46.25	2.25	-4.8
SCBI	16.75	6.50	SCB Computer Tech Inc	6.00	0.50	7.0
SEIC	78.88	38.06	SEI Corp	75.63	0.63	0.8
SMS	88.50	47.00	Shared Medical Systems	69.00	-10.69	-13.4
SSPE	24.25	10.75	Software Spectrum Inc	19.44	1.31	-6.6
SDS	40.00	22.44	SunGard Data Systems	36.00	1.38	-3.7
SYNT	39.88	5.08	Syntel Inc	24.81	-3.31	8.5
VST	13.25	10.88	VanStar Corp (L)	10.88	-1.13	-9.4

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Time to review telco contracts

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favor stockholders over customers and deliver service improvements at a slower pace.

It's a changing world where businesses need to think less about historic relationships with their carriers and more about price and service agreements, said Steve Martin, a partner at Deloitte Consulting Group in Washington. Martin has helped negotiate 50 service contracts for business users in the past year.

A lot of big companies aren't doing that as aggressively as they might, Martin said. "The reason is that they have good relationships built up with vendors and perceive they are being taken care of, but [they] aren't careful in [contract] negotiations," he said.

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But they also said the Bell Atlantic/GTE announcement won't add any competitors for local service. That's because the deal enables Bell Atlantic to have local service on both coasts, something that should invite scrutiny from federal regulators, users and analysts said.

LOCAL GAP

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Shea said one regional carrier, which he wouldn't name, that underwent a recent merger took months to develop a new back office for colleges working with Boston University. He attributed the delay to a new post-merger culture at the carrier that made all processes slower.

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THINK SNAILS

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Make your best deal

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TELCO FRENZY

The biggest mergers and alliances in the telecommunications industry in the past 18 months

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* At time of announcement

Source: Computerworld and other news reports

ERP increasingly more than a year 2000 fix

CONTINUED FROM PAGE 1

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Corning, Inc., a $4 billion maker of optical fiber, glass and other products, information systems did use the year 2000 to help sell to management a purchase of PeopleSoft, Inc.'s finance and human resources software. "But eventually, we would have had to do this anyway," said Rick Beers, a strategic process leader at the Corning, N.Y., company.

And a rollout of PeopleSoft's manufacturing, distribution and planning applications that started at Corning last month is being driven purely by business needs, he added.

For example, the company wants to more accurately set order delivery times with its customers. "We're changing the way the business thinks and feels," Beers said.

Virginia Power Co. also used year 2000 savings to help cost-justify an installation of SAP AG's R/3 applications that went live last month.

But the big reason for buying R/3 was to get away from home-grown applications that made it hard for the Richmond-based electric utility to compete in a deregulated market.

"We don't want to look like a public utility now," said Lyn McDermid, acting chief information officer at Virginia Power. "We want to look like a real business that's out to get other people's customers."

An upcoming report by The Yankee Group in Boston says the year 2000 impact on ERP sales has been overstated and predicts that annual compound growth rates will stay above 30%. And AMR Research, Inc., also in Boston, forecasts yearly ERP market growth of about 37% through 2002.

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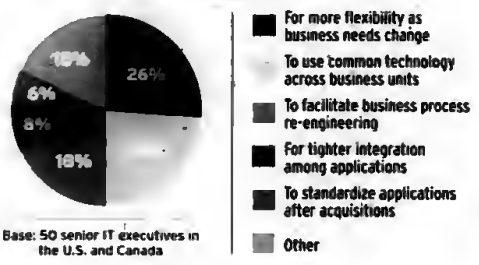
The year 2000 isn't an issue for Boart Longyear Co., a maker of diamond-based tools used in exploratory drilling. Its character-mode Unix applications don't need any fixes, said Steven Murray, MIS manager at the Salt Lake City company.

But the software doesn't support Internet access and has limited production-planning capabilities, Murray said. As a result, he added, Boart Longyear is looking at swapping in new ERP software during the next couple of years. □

WHY BUY?

Primary reasons for replacing an application with packaged software



Base: 50 senior IT executives in the U.S. and Canada

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WHY BUY?

Primary reasons for replacing an application with packaged software

Base: 50 senior IT executives in the U.S. and Canada

- For more flexibility as business needs change
- To use common technology across business units
- To facilitate business process re-engineering
- For tighter integration among applications
- To standardize applications after acquisitions
- Other

Source: Forrester Research, Inc., Cambridge, Mass.

Desktop margins tripping up HP

▸ *Vendor plays catch-up on several fronts in battles with Dell, Sun, IBM*

By Jaikumar Vijayan

HEWLETT-PACKARD's continuing transition from a vendor of proprietary systems to a purveyor of commodity Wintel platforms and electronic-commerce technologies hasn't been a particularly easy one for the company so far.

Damaging price wars, slow inventory turns — compared with market leaders such as Dell Computer Corp. — and weak Asian markets have combined to put enormous pressure on Hewlett-Packard Co.'s margins on the Wintel side of its business, said James Garden, an analyst at Technology Business Research.

On the plus side, HP's focus on PC technologies and Windows NT has made it one of the top players in the PC server and workstation space. But that has also resulted in HP being pushed out from its top spot by Sun Microsystems, Inc. in the high-margin Unix server business. Recent figures from Framingham, Mass.-based International Data Corp. place Sun ahead of HP and IBM in the Unix server market.

"HP is losing the MIPS-per-dollar war with Sun. . . . Some of their high-end Unix servers are more expensive than Sun's," said David Krauthamer, director of information technology at Advanced Fibre Communications, a Petaluma, Calif.-based vendor of telecommunications equipment that uses both Sun and HP equipment.

Similarly, a slowness to articulate its strategy in electronic-commerce applications has HP playing catch-up with vendors such as IBM. Although HP has rolled out a series of products and services during the past year, even its own executives acknowledged that it has failed so far to get the message out to its users [CW, May 11]. □

MISSING THE MARK

Hewlett-Packard hasn't met analysts' earnings-per-share expectations since last year's first quarter

Quarter	Expected	Actual
Q2 1998 (ended April 30, 1998)	$0.77	$0.65
Q1 1998 (ended Jan. 31, 1998)	$0.88	$0.86
Q4 1997 (ended Oct. 31, 1997)	$0.77	$0.75
Q3 1997 (ended July 31, 1997)	$0.68	$0.58
Q2 1997 (ended April 30, 1997)	$0.80	$0.75
Q1 1997 (ended Jan. 31, 1997)	$0.75	$0.87

HP tightens its belt

CONTINUED FROM PAGE 1

sistently remained profitable during the period — in the most recent quarter it made a profit of $685 million compared with $784 million in the same period last year.

The issue assumes importance at a time when HP is trying to expand its business in crucial technology areas (see related story, above).

For instance, the agenda at this week's HP World — including sessions on Intel's IA-64 chip, electronic commerce and a separate conference for enterprise resource planning technologies — reflects HP's attempts to "aggressively expand well beyond its traditional hardware and operating system base," said Chuck Piercey, executive director of Interex, an international association that represents 35,000 HP user sites.

But the latest news underscores the struggle HP is having in transitioning from a high-margin proprietary business based on Unix and PA-RISC processors to one based on low-margin commodity technologies from Intel and Microsoft Corp., said James Garden, an analyst at Technology Business Research, Inc. in Hampton, N.H.

"I guess it is just not happening as fast as they had hoped it would," Garden said. The cost-cutting moves are probably an attempt by HP "to show everybody that they are very serious about getting expenses under control" in the new low-margin environment, he said.

John Montgomery's biggest concern about cost-cutting exercises at this stage is the potential impact on service and support. "Already over the last two years, we have seen a big degradation in their support across all their lines," said Montgomery, chief information officer at Embarcadero Systems Corp., an Alameda, Calif.-based provider of manne transportation logistics services.

He couldn't say whether the decline is related to any broader problems within HP, but support from the company on its high-end HP 9000 Unix servers is at a point where Montgomery said he is thinking of outsourcing it to another company. One example: Two of the HP representatives servicing his account quit during the past month and haven't been replaced yet.

Despite such incidents, HP's customer satisfaction levels continue to be as high as ever in HP-conducted customer polls, said Tom Ashburn, vice president and general manager of HP's 24,000-employee customer service business unit.

"Though we have been in cost-cutting mode for some time, we have excluded all support and customer-facing activities from any belt-tightening" exercises, Ashburn said.

During the past year, in fact, HP has added between 10% and 15% to its total staffing at its call center operations, he said, though he declined to specify a number. □

TRW future tied to IT

CONTINUED FROM PAGE 1

pressure from the automakers to cut the costs of our products," said Neil Fox, manager of advanced development and applied technology at Cleveland-based TRW. Toward that end, TRW's information systems group is forging ahead with rollouts of manufacturing and human resources applications from SAP AG and PeopleSoft, Inc. in an effort to slash the cost of doing business.

"The SAP project will help make our manufacturing resource planning more efficient, while [the PeopleSoft effort] will help us lower human resources administrative costs," Fox said.

But it is unclear how an 18-month plan to cut 7,500 jobs along with $300 million in capital expenditures over five years will affect those projects. TRW's plan also calls for the company to thin its supply chain by halving the number of suppliers it uses during the next few years.

"It's too soon to tell," Fox said. "We probably won't know until year-end. But since these are strategic initiatives for TRW, I can't imagine we'd cut off our nose to spite our face."

Plans to reduce by half the number of suppliers TRW uses drew applause from analysts.

"This is a very smart move and a critical element for TRW's continued profitability," said Jim Mateyka, vice president of the automotive practice at management consultancy A. T. Kearney, Inc. in Southfield, Mich. "They can tell their suppliers to reduce costs and improve their technology. The ones that do [will] receive a bigger piece of TRW's business as other suppliers are dropped." This is the beginning of a trend for top-tier automotive suppliers, he added.

Fox said he looks forward to dealing with fewer suppliers.

"Dealing with fewer suppliers will provide us the ability to sign larger-volume agreements, which means lower costs and better supplier manageability for TRW," he said. "And that will help us meet our goal of lower product costs."

TRW FACTS

Headquarters: Cleveland

Q2 1998 sales: $3B

Q2 1998 net income: $126M

Employees: 79,700 (54,000 in automotive unit)

Business: The largest independent automotive supplier in North America. Product lines include occupant restraint systems, electrical and electronic systems, steering wheels, steering and suspension systems and engine valves.

Other units include space, defense and information systems.

MUCH-NEEDED PROJECTS

Analysts also see the SAP and PeopleSoft projects as key.

"The last thing TRW can afford to do would be to slow or stop the implementation of the two systems," said James Shepherd, a vice president at AMR Research, Inc., an enterprise resource planning consultancy in Boston. "It would be very difficult for TRW to realize any business improvement without them. They're needed to support what would essentially become a new company."

The SAP package can help reduce the size of inventory, cut lead times and improve use of labor through better planning and scheduling, according to Shepherd.

"And doing HR through the application can save millions of dollars in administrative costs because HR requires an army of people in a company the size of TRW. Working more efficiently with fewer people drives down operational costs, which in turn lowers product costs," he said. □

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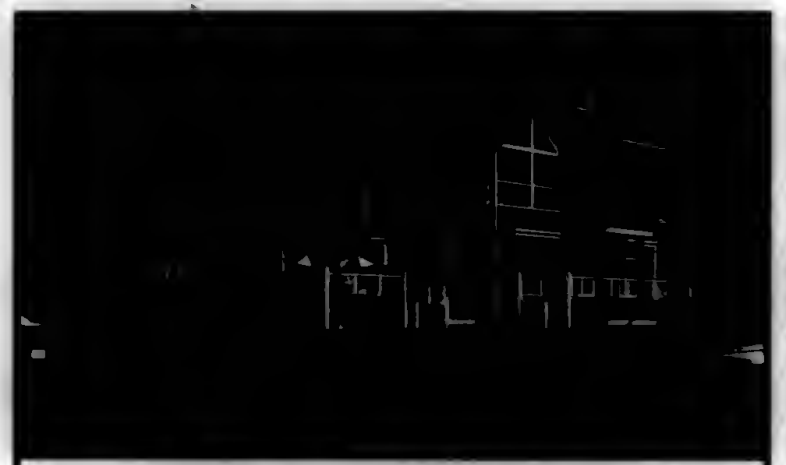
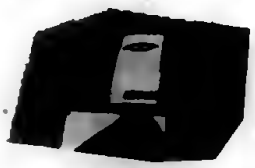
Dispatches & images from the fringes of the electronic frontier



Winner of the Golden Mouse award

David A. Wakeford's ultrarealistic rendering of the Billfish Club building won the Best of Show award at the recent Golden Mouse Computer Art Competition, sponsored by Intergraph Corp. All of the entries used Intergraph graphics hardware and/or software.

Digital archives



40 YEARS AGO
(AUGUST 1958)

- **A Bell Labs paper outlines the laser concept and design, the first step toward fiber-optic communications.**

20 YEARS AGO
(AUGUST 1978)

- **Headline: "Calif. quake keeps things hopping at DP centers"**

10 YEARS AGO
(AUGUST 1988)

- **Unisys Corp. pays $350 million to buy Convergent Technologies for its Unix expertise.**

THE FIFTH WAVE

BY RICH TENNANT

E-Mail Rich Tennant at the wave@tiac.net

"ALL I'M GOING TO SAY IS, BE VERY CAREFUL ASSIGNING PROJECTS AROUND THE 'ANCIENT TRIBAL RITES' WEB PAGE."

Inside Lines

Clinton won't sign H-1B bill

The White House said Friday that President Clinton wouldn't sign the compromise bill that was announced last week by congressional leaders regarding H-1B visas for foreign workers. The protection for U.S. workers in the current bill isn't strong enough, according to a White House spokeswoman. The bill would raise the cap on H-1B visas this year from 65,000 to 85,000, with increases to follow over the next five years. At press time, the White House was negotiating with congressional leaders on the issue.

Java suit moves forward

To cut down on some of the time-consuming legal squabbling between Sun Microsystems, Inc. and Microsoft Corp. in their lawsuit over Java, a California judge asked the two sides Friday to work together over the weekend to pin up a proposal for him to use to handle questions about which documents should be sealed or open to the public. Judge Ronald Whyte also said that he would consider appointing a special master to oversee these secret-document issues. Sun has sued Microsoft over alleged violations in the Java license Sun sold to Microsoft.

Purple prose

Barney may be a big purple dinosaur, but his public relations agency needs to hire a big purple security expert. Last week, Los Angeles-based Nine Stem Public Relations blamed "electronic tampering" for a sentence added to a recent press release about new sing-along Barney cassettes. In the text approved by Lyrick Studios, which produces Barney & Friends, a hacker allegedly added, "Instead of having them little [expletive] clamoring to stop at the next McDonald's, or those interminable whines of 'When we gonna get there' or 'I really gotta go, Mommy,' plug their ears with these latest bestsellers from Lyrick and you're guaranteed to arrive free of stress."

Just forget what you heard, OK?

Americans aren't the only ones confused by the U.S. government's stance on exporting encryption. A contingent of Egyptian security managers traveled to Las Vegas for last week's Black Hat Briefings '98 conference. But they were so befuddled by the maze of rules and regulations that they were afraid to attend Counterpane Systems President (and encryption guru) Bruce Schneier's presentation on cryptography. Conference organizers finally convinced the Egyptians that they wouldn't be violating any U.S. encryption laws just by listening.

How to make friends and influence people

Computer Associates stock may be plunging, but fightin' words are on the rise at the company. In a confidential memo to the troops, CA sales chief Rich Chiarello challenged his "children" to fight a projected 7% sales shortfall by cutting out client lunches, gang sales calls and unnecessary travel, phone calls and living — anything necessary to prove wrong the gloomy stock analysts whom Chiarello called a bunch of "number-crunching, paper-pushing, non-revenue producing pencil-neck geeks." That should certainly kindle some warm feelings about the company on Wall Street.

Better watch what you say in front of your computer — it could rat on you. Brooklyn, N.Y.-based Seem Software claims its PC-based Truster software can turn your PC "into a personal truth verifier." The company says Truster measures microtremors in the voice, letting sleuths pinpoint whether vocal stress is caused by a lie, excitement, an exaggeration or apprehension. No word yet on how well it works with software salespeople. But news editor Patricia Keefe trusts you to send her your news tips and tidbits. E-mail her at patricia_keefe@cw.com or call (508) 820-8183.

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